

CLICW/MD-03

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT TACOMA

9	UNITED STATES OF AMERICA,)	
10	Plaintiff,)	MAGISTRATES DOCKET NO.
11	v.)	CASE NO.
12	MICHAEL JAMES RICONOSCIUTO,)	COMPLAINT for VIOLATION of
13	Defendant.)	United States Code,
)	Title 21, Sections
)	841(a)(1), and
)	841(b)(1)(B)(viii)

Before Franklin D. Burgess, United States Magistrate Judge
United States Courthouse, Tacoma, Washington

Thomas A. Phillips, being duly sworn on oath states:

COUNT I

On March 29, 1991, at Pierce County, within the Western District of Washington, MICHAEL JAMES RICONOSCIUTO knowingly and intentionally did distribute one hundred (100) grams or more of a mixture or substance containing a detectable amount of methamphetamine, a Schedule II controlled substance under Title 21, United States Code, Section 812.

All in violation of Title 21, United States Code Sections 841 (a)(1) and (b)(1)(b)(viii).

UNITED STATES ATTORNEY
3600 Seafirst Fifth Avenue Plaza
Seattle, WA 98104
(206) 553-7970

COMPLAINT/RICONOSCIUTO - 1
(198ad/DTF)

Francis J. D. Kirk
AUSD

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1
2 And the complainant states:

3 1. I am a Special Agent of the Drug Enforcement Administration,
4 United States Department of Justice, and have been so employed
5 since October, 1987. In that capacity, I am assigned to
6 investigate violations of the Controlled Substance Act (Title 21,
7 United States Code, Section 801, et seq.).

8 2. On or about January 30, 1991, a Cooperating Individual (CI)
9 advised me that the CI had obtained quantities of methamphetamine
10 and methadone from Michael J. Riconosciuto over the past ten years.
11 I was familiar with allegations of drug trafficking regarding
12 Michael Riconosciuto based upon numerous conversations with other
13 law enforcement officers and cooperating individuals over the past
14 several years. I am also aware that Michael Riconosciuto was
15 arrested in 1972 for manufacture of controlled substances
16 subsequently convicted.

17 3. On February 7, 1991, a CI contacted Washington State Patrol
18 Detective Ron Ritter, and advised Detective Ritter that Michael
19 Riconosciuto had just delivered a quantity of purported methadone
20 to the CI. Detective Ritter and Washington State Patrol Detective
21 Sgt. Mike Matlick obtained the purported methadone from the CI as
22 well as an audio cassette recording of a conversation between the
23 CI and Riconosciuto. The methadone was tested by a DEA Forensic
24 Chemist who advised me that the substance was 9.347 grams net
25 weight of 97% pure methadone. I have reviewed the audio cassette
26 recording of the conversation between the CI and Riconosciuto

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COMPLAINT/RICONOSCIUTO - 2
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FORM ORD. 11
MAR 88

1 during which time they discuss the instant delivery of methadone
 2 and future delivery of methamphetamine and methadone, and the CI
 3 paid Riconosciuto two thousand dollars (\$2,000.00) for past amounts
 4 of methadone and methamphetamine delivered to the CI by
 5 Riconosciuto.
 6

7 4. On the evening of March 3, 1991, a CI advised me that
 8 Michael Riconosciuto had just delivered what was purported to be
 9 forty (40) grams of methadone and one pound of methamphetamine to
 10 the CI in Pierce County, Washington. I obtained the purported
 11 methadone and methamphetamine from the CI. The purported
 12 methamphetamine had the appearance and odor of methamphetamine and
 13 weighed approximately 528.1 gross grams. The purported methadone
 14 was similar in appearance to the methadone previously obtained from
 15 a CI on February 7, 1991. I also retrieved audio and video
 16 recordings of conversation between the CI and Riconosciuto during
 17 which they discuss the instant delivery and the CI paid
 18 Riconosciuto nine hundred dollars (\$900.00) as payment for the
 19 methadone delivered by Riconosciuto to a CI on February 7, 1991.

20 5. On March 4, 1991, the CI advised me that Michael
 21 Riconosciuto had met with the CI in Pierce County, Washington to
 22 collect money for the March 3, 1991 delivery. I retrieved audio
 23 and video recordings of the meeting and have reviewed the
 24 recordings. During the conversation the CI paid Riconosciuto three
 25 hundred dollars (\$300.00) and engaged in general conversation
 26 regarding drug trafficking.

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COMPLAINT/RICONOSCIUTO - 3
 (198ad/DTF)

FORM ORD-103
 MAR 82

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1 6. On March 10, 1991, the CI advised me that Michael
 2 Riconosciuto had met with the CI in Pierce County, Washington to
 3 collect money for the March 3, 1991 delivery. I retrieved audio
 4 and video recordings of the conversation between the CI and
 5 Riconosciuto during which the CI gave Riconosciuto four hundred
 6 dollars (\$400.00) and discussed future payments. Riconosciuto and
 7 the CI also had a general discussion about drug dealing.
 8 Riconosciuto asked the CI if the CI had had any "heat" referring to
 9 law enforcement scrutiny.

10 7. On March 23, 1991, Michael Riconosciuto met with a CI in
 11 Lakebay, Washington. This meeting was surveilled by DEA Special
 12 Agents Yong Chin and Ian McKenzie. The meeting was also video and
 13 audio recorded. I have reviewed the recordings of the meeting,
 14 during which the CI paid Riconosciuto ten thousand dollars
 15 (\$10,000.00) for the methamphetamine and methadone delivered to a
 16 CI on March 3, 1991. During the meeting, the CI told Riconosciuto
 17 that the CI did not have any "crank" (the street vernacular for
 18 methamphetamine) and needed another pound of methamphetamine.
 19 Riconosciuto asked the CI about his supply of "done" (referring to
 20 methadone). On several occasions, Riconosciuto inquired as to
 21 whether the CI had experienced any "heat" (referring to law
 22 enforcement scrutiny or intervention). Riconosciuto also outlined a
 23 procedure for the synthesis of methamphetamine for the CI and
 24 engaged in general conversation regarding supply, demand for and
 25 opinions about various controlled substances.
 26

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COMPLAINT/RICONOSCIUTO - 4
 (198ad/DTF)

FORM ORD-113
 MAR 85

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 CLERK OF THE COURT
 THIS INFORMATION IS FOR THE ATTORNEY'S OFFICE
 ONLY AND IS NOT TO BE USED FOR ANY OTHER
 PURPOSES
 (198ad/DTF)

1 8. On March 29, 1991, surveillance had been established on a
 2 residence in Lakebay, Washington by DEA Agents. At about
 3 5:30 p.m., surveillance agents observed Michael Riconosciuto in the
 4 residence and through video and audio surveillance saw Riconosciuto
 5 deliver a quantity of methamphetamine to an individual identified
 6 as Steve Halvorson. Agents observed Halvorson pay Riconosciuto
 7 five thousand dollars (\$5,000.00). During the conversation
 8 Riconosciuto told Halvorson that he had brought "crank" for
 9 Halvorson. Riconosciuto was then observed departing Halvorson's
 10 residence in a silver Honda bearing Washington license 689BXE.
 11 Agents observed Rodney Dean Hill driving the vehicle; Riconosciuto
 12 sitting in the front passenger seat and Andrea May Zumwalt sitting
 13 in the rear seat. Agents executed a vehicle stop approximately one
 14 mile from the Halvorson residence, placing Riconosciuto, Hill and
 15 Zumwalt under arrest. I searched Riconosciuto's person and found,
 16 among other things, two bundles of U.S. Currency. I noted that
 17 Riconosciuto emitted a strong chemical odor which I associate with
 18 chemicals used to manufacture methamphetamine.

19 9. After being advised of his rights pursuant to Miranda, Hill
 20 told Special Agent McKenzie and me that Riconosciuto arrived at a
 21 residence in SeaTac, Washington earlier that day by taxi; that it
 22 was his understanding that Riconosciuto had arrived in Seattle by
 23 airplane earlier that day, and that Riconosciuto had asked Hill for
 24 a ride to the Lakebay, Washington area. Hill further stated that
 25 he had performed the same service for Riconosciuto on two prior
 26

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COMPLAINT/RICONOSCIUTO - 5
 (198ad/DTF)

FORM ODD-127
 MAR 87

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occasions. Hill said that Riconosciuto emitted a strong chemical odor which Hill associated with chemicals used to manufacture methamphetamine. Hill said that he had known Riconosciuto for approximately three months and had met him through Andrea Zumwalt. Hill also said that he is currently receiving methadone treatments and that Zumwalt was attempting to "kick" a heroin habit.

10. After being advised of her rights pursuant to Miranda, Zumwalt told me that she was just "along for the ride." Zumwalt also advised that Agents should talk to her boyfriend (Hill) since he knew more about what had happened.

11. I performed a field test on the purported methamphetamine and obtained positive results for the presence of methamphetamine. The purported methamphetamine weighed approximately 545.1 gross grams.

12. Based upon the foregoing information, I believe that Michael James Riconosciuto knowingly and intentionally did distribute one hundred (100) grams or more of a mixture or substance containing a detectable amount of methamphetamine on March 29, 1991, in Pierce County, Washington.

THOMAS A. PHILLIPS, Complainant
Special Agent, DEA

Complaint and affidavit sworn to before me and subscribed in my presence on this _____ day of April, 1991.

UNITED STATES MAGISTRATE JUDGE

UNITED STATES ATTORNEY
3600 Seafirst Fifth Avenue Plaza
Seattle, WA 98104
(206) 553-7970

COMPLAINT/RICONOSCIUTO - 6
(198ad/DTF)

UND-145
MAR 92

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CL/CW/MID-04

Plaintiff,

NO.

v.

MOTION FOR DETENTION
HEARING

Defendant.

1. Eligibility of Case.

This case is eligible for a

____ Crime of violence (18 U.S.C. § 3156)

____ Maximum sentence life imprisonment or death

XX 10+ year drug offense

XX Serious risk defendant will flee

____ Felony, with two prior convictions in above categories

____ Serious risk obstruction of justice

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N. N. 1991

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1 2. Reason for Detention. The Court should detain
2 defendants because there are no conditions of release which will
3 reasonably assure:

- 4 XX Defendants' appearance as required
5 XX Safety of any other person and the community

6 3. Rebuttable Presumption. The United States will invoke
7 the rebuttable presumption against defendant under § 3142(e).
8 The presumption applies because: (check one or both)

- 9 XX Probable cause to believe defendant committed 10+
10 year drug offense or firearms offense, 18 U.S.C.
11 § 924(c)
12 Previous conviction for "eligible" offense
13 committed while on pretrial bond

14 4. Time for Detention Hearing. The United States requests
15 the court conduct the detention hearing:

- 16 At first appearance
17 XX After a continuance of 3 days.

18 5. Other matters.
19

20 DATED this 1st day of April, 1991.

21 Respectfully submitted,
22 MIKE MCKAY
23 United States Attorney
24
25 FRANCIS J. DISKIN
26 Assistant United States Attorney

100-100000-1
MAR 13
MOTION FOR DETENTION
HEARING/ - 2

UNITED STATES ATTORNEY
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PR(CW)WR-03

May 23, 1973

\$80,000 Given Son

MAY 23 1973

For Research, Says

Dope Suspect's Dad

BY MARIBETH MORRIS

Tacoma entrepreneur Marshall Riconosciuto testified in federal court here yesterday he "gave" his son \$80,000 which he gave to his son, Michael, in "advances" to develop chemical and electronic products for possible sale and profit.

The elder Riconosciuto described his son — on trial here on charges of making dope in a Duwamish River underwater laboratory — as an electronic genius who made his own telephone system at the age of 10.

Marshall Riconosciuto, 48, failed to show what if anything his son had developed with the \$80,000 which the father had borrowed.

Asked by defense attorney Gerald Palm if the elder Riconosciuto was ever able to pay the money back, the witness replied, "No."

Michael Riconosciuto, 24, is accused of setting up laboratories around the city for the purpose of making hallucinogens for

sale on the illicit drug market.

The government contends the defendant moved his chemicals from place to place — the last being inside a boat house in the South Park Boat House.

The laboratory could only be reached by jumping off a boat in the river, swimming underwater, and emerging through a trap door under the boat house.

The elder Riconosciuto testified he was getting back in the "advertising and public relations business" after "my company went bankrupt" a few years ago. He said he borrowed for his son so that "something could be made of his (Michael's) talent."

The father denied his son ever manufactured illegal drugs and said it was his belief the Duwamish River lab was for the purpose of developing "underwater research."

Pressed for an explanation, the father said his son had discussed "using electronic means to clean up pollutants in the water."

Michael Riconosciuto

Riconosciuto Takes Stand in Son's Trial

MAY 23 1973

Michael Riconosciuto

SEATTLE — The father of Michael Riconosciuto testified in federal court here Tuesday that he borrowed \$80,000 from friends and gave it to his son to develop chemical and electronic products for possible sale.

Marshall Riconosciuto, 48, of Tacoma, described his son as an electronic genius who made his own telephone system at the age of 10.

Michael Riconosciuto, 24, of Seattle, is on trial on charges of manufacturing hallucinogens in a Duwamish River laboratory.

The elder Riconosciuto did not say what, if anything, his son had developed with the \$80,000 he borrowed funds. He had never been able to repay the money, Marshall Riconosciuto said under questioning by defense attorney Gerald Palm.

The defendant was arrested last September by federal narcotics agents who said they had him under surveillance off and on since 1968.

Two witnesses subpoenaed by the government failed to show. They are Lester Wooten, the defendant's father-in-law, who was arrested in connection with the case but was later dismissed as a defendant, and John Hult, the man who purportedly sold the drugs Riconosciuto made.

Assistant U.S. Atty. Gen. Schwartz said the pair had "vanished."

In Monday's trial session, a witness said his life and those of others scheduled to testify against Riconosciuto had been "threatened."

The non-jury trial, before U.S. District Judge Walter McGovern, continued today.

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TECHNOLOGY & MEDICINE

Scientific Team Develops Arthritic Rats, Bolstering Belief That Gene Is to Blame

By Jerry E. Bishop

Staff Reporter of The Wall Street Journal

Scientists inserted a human gene linked to a type of arthritis into rats that subsequently developed an arthritic disorder almost identical to that seen in humans.

The feat bolstered researchers' belief that the human gene is involved in causing a group of arthritic disorders, known as spondyloarthropathies, that afflict an estimated 200,000 Americans. One of the more common of the disorders is ankylosing spondylitis which, in severe cases, leads to a fusing of the vertebrae in the back to produce a stiff or "poker" spine and a bent posture.

The family of rats, the first true animal models of any arthritic disease, should be invaluable for testing new therapies and uncovering causes of the disorders, researchers said. The animals also are the first rats to successfully accept the trans-

plant of a human gene. Until now, genetic alterations have been carried out largely in laboratory mice and, in a few cases, in sheep, goats, pigs and cattle.

The development was hailed as a "remarkable scientific advance in the field of arthritis" by Lawrence E. Shulman, director of the federal government's National Institute of Arthritis, Musculoskeletal and Skin Diseases, part of the National Institutes of Health, which helped fund the research.

Development of the new "transgenic" rats was reported in this month's issue of the Journal Cell by scientists from the Harold C. Simmons Arthritis Research Center and the Howard Hughes Medical Institute, both of which are at the University of Texas Southwestern Medical Center in Dallas. Mr. Simmons, whose pits set up the arthritis center in 1982, is a Dallas millionaire who controls NL Industries Inc., a

Houston chemicals concern, and who currently is in the news with a \$1.6 billion offer to take Lockheed Corp. private. Mr. Simmons has ankylosing spondylitis.

The types of arthritis involved in the research are considerably less common than rheumatoid arthritis, the most prevalent arthritis. Attempts to produce transgenic rats with the more common arthritic disorders haven't yet been successful, the Dallas researchers said.

Besides ankylosing spondylitis, the disorders represented in the new-bred rats include reactive arthritis (also known as Reiter's syndrome) and juvenile spondyloarthropathy as well as arthritis that sometimes occurs with psoriasis and that which occurs in conjunction with Crohn's disease. These latter disorders also afflict the spine in some patients. All the disorders frequently involve inflammation of the stomach and intestines, and all most often strike young adults, with males being stricken more often than females.

The cause, or causes, of these disorders is unknown, but in the early 1970s scientists began to suspect a gene was involved. It was found that 90% of the patients with

ankylosing spondylitis carried a variation of a gene known as the HLA-B27 variation. Only about 7% of the Caucasian population has this particular variation of the gene.

In the late 1980s, a theory began to emerge that the 7% of the population that inherits the HLA-B27 gene may be highly susceptible to these somewhat uncommon arthritic disorders. The disorders don't develop, however, until these genetically susceptible people encounter something in the environment. Evidence indicates that the environmental "co-factor" is likely any of several common bacteria. This theory can now be tested with the newly developed arthritic rats.

In the Dallas research, Dr. Joel D. Taurog of the Simmons center, who had studied the HLA-B27 link to the disorders for a decade, teamed up with Dr. Robert E. Hammer of the Hughes Institute, who is an expert in developing transgenic animals. The pair injected human DNA containing the HLA-B27 gene into more than 650 fertilized rat eggs and implanted the eggs into female rats. From the few rats that became pregnant, the scientists were able to obtain six rats in which the human

genes were functioning.

The subsequent generations of only one of the original female rats began developing disease at 10 weeks of age. The stomach and intestinal tissues, the skin, nails and tails of the animals developed changes that pathologists said were almost identical to changes seen in human patients with the disorders.

"This demonstrates that HLA-B27 is the genetic element involved in the pathogenesis of the spondyloarthropathies," declared Dr. Peter E. Lipsky, director of the Simmons center.

PR/GR/GR-04

MANUFACTURERS

- Dow Chemical USA, Hq, 2020 Dow Center, Midland, MI 48640, (517) 636-1000; Prodn site: PO Box K, Freeport, TX 77541 [9]
- PPG Industries, Inc, (Hq), One PPG Place, Pittsburgh, PA 15272, (412) 434-3131; Prodn site: Chemicals Group, PO Box 1000, Lake Charles, LA 70601 [9]
- Vulcan Materials Co, (Hq), PO Box 7497, Birmingham, AL 35253, (205) 877-3000; Prodn site: Vulcan Chemicals, division, PO Box 227, Geismar, LA 70734 [9]

OTHER MANUFACTURING INFORMATION

- Discontinued 1985, by the Dow Chemical Co, Organics Dept [10]

U.S. PRODUCTION

- (1973) 548,394,000 lb [16]
- (1966) 242,943,000 lb [16]
- (1981) 613,993 (1,000 unit lb) [17]
- (1978) 2.92X10+11 grams [2]
- (1983) 2.26X10+11 grams [2]
- The growth rate from 1973-1982 was 3.2% per Year and a growth rate of 3 to 5% per year is predicted through 1987. [15]
- (1985) 3.94X10+11 grams [18]
- (1987) 725 million of lb (estimated) [7]
- (1987) 6.94X10+8 lb [19]

U.S. IMPORTS

- (1985) 9.08X10+9 grams, based on various trade estimates. [20]

U.S. EXPORTS

- (1978) 1.80X10+10 grams [2]
- (1983) 2.58X10+10 grams [2]
- (1985) 1.81X10+10 grams [21]
- (1987) 11,420,877 Lb [22]

III MAJOR USES AND CONSUMPTION

MAJOR USES

- Solvent for natural and synthetic resins, oils, waxes, tar and alkaloids [11]
- Dry cleaning agent [12]
- Cleaning plastic molds [1]
- Formerly used with ethylene gas for degreening citrus fruits and postharvest fumigation of strawberries [13]
- Solvent for various insecticides (Former use). [13]
- Cleaning solvent, especially for electrical machinery and plastics; spotting fluid in textile processing; component of aerosol formulations; chemical int for organic chemicals (eg, vinylidene chloride); solvent for adhesives and coatings; coolant and lubricant in metal cutting oils; extraction solvent; component of inks and drain cleaners; solvent for photoresist polymers; solvent in textile dyeing. [2]
- The largest other use, besides as cleaning solvent, is in aerosols, in which it acts both as a vapor pressure depressant (making it a good propellant) and as a solvent and carrier for many of the active ingredients used in aerosols. [4]
- Yields of 90-95% of acetyl chloride are obtained by heating acetic acid and 1,1,1-trichloroethane under pressure in the presence of FeCl_3 and HCl . [3]
- Vapor degreasing [3]
- Solvent for cleaning precision instruments; metal degreasing [14]

CONSUMPTION PATTERNS

- Cold cleaning, 40%; Vapor degreasing, 22%; Adhesives, 12%; Aerosols, 10%; Exports, 5%; Electronics, 6%; Coatings, 1%; Miscellaneous, 4%. [15]
- Cleaning solvent, 70%; aerosols, 5%; chemical int, 3%; other, 22% (1980, est) [2]
- Cold cleaning, 41%; vapor degreasing, 22%; adhesives, 10%; aerosols, 7%; electronics, 6%; intermediate, 4%; coatings, 2%; other, 1%; export, 7% (1985). [2]

IV CHEMICAL AND PHYSICAL PROPERTIES

COLOR AND FORM

- Colorless liquid [23]

ODOR

- Chloroform-like odor; sweetish [24]

BOILING POINT

- 74.1 Deg C at 760 mm hg [25]

MELTING POINT

- -30.4 Deg C [25]

MOLECULAR WEIGHT

- 133.42 [1]

CRITICAL TEMPERATURE and PRESSURE

- 311.5 Deg C; 4.48 MPa [3]

DENSITY/SPECIFIC GRAVITY

- 1.3376 At 20 Deg C/4 Deg C [1]

HEAT OF COMBUSTION

- 4700 Btu/lb= 2600 cal/G= 110×10^5 J/kg [24]

HEAT OF VAPORIZATION

- 8012.7 gcal/gmole [25]

OCTANOL/WATER PARTITION COEFFICIENT

- Log Kow= 2.49 [27]

SOLUBILITIES

- Soluble in acetone, benzene, methanol, carbon tetrachloride [1]
- Greater than 10% in ethanol [28]
- 4,400 mg/l in water at 20 Deg C [29]
- Soluble in carbon disulfide [30]
- Greater than 10% in ethyl ether [28]
- Greater than 10% in chloroform [28]

SPECTRAL PROPERTIES

- Index of refraction: 1.43838 at 20 Deg C/D [1]
- IR: 19461 (Sadtlter Research Laboratories Prism Collection) [28]
- NMR: 9171 (Sadtlter Research Laboratories Spectral Collection) [28]
- MASS: 618 (Atlas of Mass Spectral Data, John Wiley and Sons, New York) [28]

SURFACE TENSION

- 25.4 Dynes/cm= 0.0254 newtons/M at 20 Deg C [24]

VAPOR DENSITY

- 4.63, relative (Air= 1) [29]

VAPOR PRESSURE

- 127 Mm hg at 25 Deg C [31]

RELATIVE EVAPORATION RATE

- 12.8 (Butyl acetate= 1) [32]

VISCOSITY

- 0.858 cp @ 20 Deg C [3]

FLAMMABLE LIMITS

- 8.0% and 10.5% [130]
- Limits of flammability of vapors of inhibited 1,1,1-trichloroethane have been found to be 10 to 15.5% in air with hot wire. A considerable amount of energy is required for ignition.

FLASH POINT

- No flash point in conventional closed tester at room temp. [130]

AUTOIGNITION TEMPERATURE

- 537 Deg C, 998 Deg F [130]

OTHER CHEMICAL AND PHYSICAL PROPERTIES

- Percent in saturated air: 16.7 at 25 Deg C; equivalencies: 1 mg/kg= 183 ppm and 1 ppm= 5.46 mg/l at 25 Deg C, 760 torr [23]
- Latent heat of vaporization: 100 btu= 58 cal/g= 2.4×10^5 J/kg [24]
- Liquid-water interfacial tension: 45 dynes/cm= 0.045 N/m at 20 Deg C (est) [24]
- Ratio of specific heats of vapor (gas): 1.104 [24]
- Saturated concentration in air 726 g/cuM at 20 Deg C, 1,088 g/cuM at 30 Deg C [29]
- Partition coefficients at 37 Deg C for 1,1,1-trichloroethane into blood= 3.3; into oil= 356. [33]
- Dielectric constant: 7.53 at 20 Deg C (liquid) [34]
- Specific heat at 20 Deg C: 1.004 J/g (liquid); 0.782 J/g [3]
- Dipole moment: 1.78 Debyes [25]
- Heat of capacity at 25 Deg C: 34.4 cal/gmole at 1 atmosphere (liquid); 22.4 cal/gmole at 1 atm (gas) [25]
- Chloroethene VG Solvent: Freezing Point -36.9 Deg C; Boiling range at 760 mm Hg 72-88 Deg C; Density 1.232 g/ml at 20 Deg C; Specific gravity 1.327 at 20 Deg C/20 Deg C, 1.333 at 60 Deg C/60 Deg C, 1.320 at 25 Deg C/25 Deg C; Heat of vaporization 7.8 kcal/mol at 20 Deg C, 7.5 kcal/mol at 50 Deg C, 7.1 kcal/mol at 80 Deg C (calculated); Dielectric constant at 24 Deg C 10.0 at 10^3 cps, 7.0 at 10^5 cps [8]

CORROSIVITY

- Readily corrodes aluminum and aluminum alloys [26]
- Dry, uninhibited 1,1,1-trichloroethane is not very corrosive to iron or zinc; corrosion rate with iron is less than 2.54 um/year (less than 0.1 mpy) and with zinc less than 25.4 um/year (less than 1.0 mpy). Addition of 7% water increases corrosion rates 254 um/year (less than 10.0 mpy) for iron and greater than 254 um/year (greater than 10.0 mpy) for zinc. The presence of both water and ethanol increase iron or tin attack at reflux. [3]

REACTIVITIES and INCOMPATIBILITIES

- Reacts slowly with water, releasing corrosive hydrochloric acid. [24]
- Although apparently stable on contact, mixtures with potassium (or its alloys) with a wide range of halocarbons are shock-sensitive and may explode with great violence on light impact. Trichloroethane was among those investigated. [132]
- Violent decomposition, with evolution of hydrogen chloride, may occur when it comes into contact with aluminum or its alloys with magnesium. [132]
- Pipe- and solenoid-valve assembly used to transfer NaK (sodium potassium) had been purged with nitrogen, then flushed with water. Trichloroethane, used subsequently to remove traces of water, contacted hidden residue of NaK in one valve and explosion ensued. [130]
- Sides of 5,000 psi autoclave were bulged by explosive reaction between oxygen and 1,1,1-trichloroethane when pressurized mixture was brought up to 100 Deg C and 790 psi and allowed to stand for 3 hours. [130]
- Several halogenated solvents reacted explosively with liquid oxygen when ignited with a high energy source: 1,1,1-trichloroethane. [130]
- Mixture of liquid oxygen with 1,1,1-trichloroethane exploded violently when initiated with a blasting cap. [132]
- Reacts violently with nitrogen tetroxide and sodium hydroxide. [133]

HAZARDOUS REACTIONS

- 1,1,1-Trichloroethane exploded after heating under oxygen gas at 54 bar and 100 Deg C for 3 hours. [132]


V PHARMACOKINETICS

ABSORPTION, DISTRIBUTION AND EXCRETION

- Trichloroethane is rapidly absorbed through both the lungs and gastrointestinal tract, but cutaneous absorption probably is too slow to produce significant toxicity unless trapped against the skin by an impermeable barrier. [35]
- Wide variations in tissue trichloroethane concentrations occur with the largest amounts found in the lipid-rich brain tissue. [35]
- The lungs excrete most of an absorbed dose unchanged. Small amounts are metabolized to trichloroacetic acid and trichloroethanol, which are excreted by the kidney. Chronic accumulation probably does not occur, although repeated exposure induces hepatic P450 mixed-function oxidase enzymes. [35]
- The low partition coefficient of 1,1,1-trichloroethane in blood and the low rate of metabolism (3.5%) in humans combine to result in a rapid, but small uptake upon inhalation and a consequently rapid rate of excretion. [36]
- After inhalation in mice 1,1,1-trichloroethane was found in brain and kidney at approx equal concentrations and in liver at higher concentrations. In rats, more than 98% of absorbed dose was rapidly expired unchanged; 0.5% was converted to CO₂. Much of remainder was excreted as glucuronide of 2,2,2-trichloroethanol in urine. [4]
- Marked difference was found in the rate of penetration of an equal area of human skin by different compounds: methylene chloride was fastest, tetrachlorethylene was slowest, and 1,1,1-trichloroethane intermediate. It may be calculated that absorption of 1,1,1-trichloroethane during 30 minutes was about 62 ug/square cm/min. True rate probably greater. [37]
- Twelve healthy subjects were exposed to approximately 250 and 350 ppm of methyl chloroform in air during rest and physical exercise on a bicycle ergometer. The duration of exposure for each subtrial was 30 minutes. Pulmonary ventilation, cardiac output and methyl chloroform concentration in alveolar air, and arterial and venous blood were determined during and after exposure. The concentration in alveolar air and arterial blood was of the same magnitude at an exposure to 350 ppm at rest as at 250 ppm during light exercise. As exercise intensity increases, a kind of levelling-off value was obtained. Increase ventilation was more important to the increase in alveolar air and arterial blood concentration than increase circulation. There was a high degree of correlation between alveolar air and arterial blood concentration. [38]
- Following intermittent inhalation exposure by adult male rats for 5 days, for 6 hours daily, the adipose tissue served as a storage site. The fat-stored molecules were not totally mobilized during the intermissions in exposure. [39]
- In human males exposed to 1,1,1-trichloroethane (213 or 72 ppm) for 8 hours the absorption rate changed continuously with a retention rate between 26-32%. Pulmonary elimination over a period of 8 days was approx 90%. Urinary excretion of the metabolites (eg, trichloroacetic acid and trichloroethanol) was slow and lasted approximately 12 days. The urinary metabolites may be used as a biological indicator of exposure to 1,1,1-trichloroethane. [40]

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Update: January 15, 1990

I IDENTIFICATION

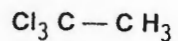
COMMON NAME

- 1,1,1-TRICHLOROETHANE

CAS REGISTRY NUMBER

- 71-55-6

CHEMICAL STRUCTURE



CHEMICAL NAME

- Ethane, 1,1,1-trichloro-

MOLECULAR FORMULA

- C₂H₃Cl₃

RTECS NUMBER

- NIOSH/KJ2975000

SHIPPING NAME AND NUMBER

- UN 2831; 1,1,1-Trichloroethane
- IMO 6.1; 1,1,1-Trichloroethane

OHM-TADS NUMBER

- 8100101

STCC NUMBER

- 49 411 76; 1,1,1-Trichloroethane

EPA HAZARDOUS WASTE NUMBER

- U226; A toxic waste when a discarded commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product.
- F002; A hazardous waste from nonspecific sources when a spent solvent.

SYNONYMS

- | | |
|--------------------------------------|--|
| • Aerothene MM | • Genklene |
| • Aerothene TT | • ICI-CF 2 |
| • AI3-02061 | • Inhibisol |
| • Algylen | • Methyl chloroform (ACGIH, DOT, OSHA) |
| • alpha-T | • Methylchloroform |
| • alpha-Trichloroethane | • Methyltrichloromethane |
| • Baltana | • NCI-C04626 |
| • Caswell No. 875 | • NSC 9367 |
| • CF 2 | • RCRA WASTE NUMBER U226 |
| • Chloroetene | • Solvent 111 |
| • Chloroethene | • Strobane |
| • Chloroethene NU | • Tafclean |
| • Chloroform, methyl- | • TCEA |
| • Chlorotene | • TRI |
| • Chlorothane NU | • TRI-ETHANE |
| • Chlorothene | • Trichloran |
| • Chlorothene (Inhibited) | • Trichloro-1,1,1-ethane [French] |
| • Chlorothene NU | • Trichloroethane (VAN) |
| • Chlorothene SM | • Trichloromethylmethane |
| • Chlorothene VG | • Trielene |
| • Chlorothene, inhibited | • UN 2831 [DOT] |
| • Chlorten | • 1,1,1 Trichloroethane |
| • Chlorylen | • 1,1,1-TCE |
| • Dowclene LS | • 1,1,1-Trichlooreethaan [Dutch] |
| • EPA Pesticide Chemical Code 081201 | • 1,1,1-Trichloraethan [German] |
| • Ethana NU | • 1,1,1-Trichloroethane |
| • Ethane, 1,1,1-Trichloro- | • 1,1,1-Trichloroethane |
| • (DOT, OSHA) | |
| • Gemalgene | • 1,1,1-Tricloroetano [Italian] |

II MANUFACTURING INFORMATION

METHODS OF MANUFACTURING

- Prepared by action of chlorine on 1,1-dichloroethane or by catalytic addition of hydrochloric acid to 1,1-dichloroethylene. USA patent 2,209,000 (Nutting, Huscher, 1940). [1]
- Dehydrochlorination of ethylene dichloride to vinyl chloride followed by reaction with hydrogen chloride to produce 1,1-dichloroethane, which is chlorinated; reaction of ethane and chlorine followed by separation plus recycle of coproducts. [2]
- 1,1,1-Trichloroethane can be produced by refluxing chlorine monoxide with carbon tetrachloride and chloroethane. [3]

IMPURITIES

- 1,1,1-Trichloroethane is available commercially in the USA in technical and solvent grades, which differ only in amount of stabilizer. Stabilized grades contain 3-8% stabilizers such as nitromethane, N-methylpyrrole, butylene oxide, 1,3-dioxolane, and secondary butyl alcohols. Typical specifications are as follows: Nonvolatile residues, 0.001% maximum; water content, 100 mg/kg maximum; acidity (as HCl), 0.001% maximum and acid acceptance (as NaOH), 0.165% min. Specifications for reagent grade acidity (as HCl), 0.001% maximum. [4]
- Stabilizing agents which may be present in small amounts include: glycol diesters, ketones, nitriles, dialkyl sulfoxides, dialkyl sulfides, dialkyl sulfites, tetraethyl lead, nitroaliphatic hydrocarbons, 2-methyl-3-butyn-2-ol, tert-butyl alcohol, 1,4-dioxane, dioxolane, sec-butyl alcohol, and monohydric acetylenic alcohols. [5]
- Chemical was found by gas chromatography to contain 1,2-dichloroethane, 1,1-dichloroethane, chloroform, carbon tetrachloride, trichloroethylene, 1,1,2-trichloroethane, and vinylidene chloride. [6]

FORMULATIONS

- 1,1,1-Trichloroethane is available commercially in the USA in technical and solvent grades, which differ only in amount of stabilizer added to prevent corrosion of metal parts. Reagent grade. [4]
- Chlorothene SM, industrial grade [7]
- Aerothene TT, aerosol grade [7]
- Industrial grade; aerosol grade; general solvent grade, 99.999% grade [7]
- Chlorothene VG solvent is a specially inhibited grade of 1,1,1-trichloroethane. Chlorothene SM and Aerothene MM solvents are special grades of 1,1,1-trichloroethane and methylene chloride. [8]

Nation

insist on a bigger increase in military spending than even the Republican-controlled Senate would accept. But Clark succeeded in bringing some order to what had been a disorganized National Security Council staff and involving Reagan in foreign policy decisions that the President had tended to slight while concentrating on domestic affairs. That accomplished, Clark considered his work done.

Meanwhile, Watt's offhand verbal zingers had offended so many domestic constituencies that a fortnight ago it became obvious that he could not stay on in the Cabinet. In a telephone conversation on Saturday, Oct. 8, the day before Watt's resignation, Reagan and Clark lightheartedly discussed the advantages Watt's replacement at Interior would enjoy: the opportunity to do a great deal of horseback riding in fresh air, for example.

switch would serve Reagan's political interests, but even more, says one adviser, that "the President believes he is doing Clark a favor." In either case, the consequences for Administration policy—and re-election politics—will be the same. They are likely to be far more evident in foreign than in domestic affairs.

Interior is scarcely a rest-and-recreation post, as Watt's tenure abundantly proved. But at least the policies that Clark will carry out are fairly well set; their common theme is a tilt away from what conservatives felt had become an exaggerated concern for protection of the environment and toward accelerated commercial development of Government land. Reagan had been looking for a Secretary whose appointment would assure Western right-wingers, an important part of the President's political power base,

diplomats and Congressmen. He came back to the NSC from State early in 1982 to serve as Clark's chief deputy.

Technically he still holds that post, but for the past three months he has been working primarily as U.S. special envoy to the Middle East, trying to patch together some kind of settlement of the chaotic civil war in Lebanon. By coincidence, McFarlane arrived back in Washington last week and lunched with Clark and Shultz as Reagan was about to announce Clark's transfer. McFarlane had been summoned home for a review of Middle East policy, which took on added importance last week with disclosure of an Administration plan to equip two Jordanian brigades as a pro-Western strike force ready to act in emergencies in the Persian Gulf region.

Kirkpatrick's candidacy was pushed



On the day Clark decided to move, Reagan meets with McFarlane, Vice President Bush, Secretary Shultz and the new man for Interior

Apparently, both thought they were jesting. The leading candidate to succeed Watt was former Republican Senator Clifford Hansen of Wyoming.

By last Wednesday, however, Hansen had turned down the job for health reasons, and Clark decided that he actually wanted Watt's post. He approached Presidential Counsellor Edwin Meese, another ally from Reagan's California staff. Meese advised Clark to speak directly to Reagan. Clark met with the President Thursday morning, in such secrecy that Shultz later lunched with him and returned to the State Department unaware that any change was in the works. At 3 p.m., right after the lunch, Reagan telephoned Clark to say the job was his if he really wanted it. Clark accepted. Reagan's announcement to the churchwomen followed within three hours.

In sum, Clark decided to try for a job that Reagan, on the advice of several aides and probably also Nancy, was simultaneously attempting to nudge him into. The reason was partly that the

that those policies would continue without being enmeshed in the controversies set off by Watt's loose-lipped remarks. There is a political liability too: environmentalists angrily attacked Clark's appointment, correctly reading it as a sign that nothing much would change.

In overseas affairs, however, Clark's transfer is anything but a guarantee of continuity in policy. That has never been the Administration's strong point anyway; the Reagan years have been marked by frequent switches of both policy and personnel. Allies and adversaries who already have had to deal with two Secretaries of State will now have to accustom themselves to Reagan's third National Security Adviser.

McFarlane is a former Marine lieutenant colonel who has served in various posts at the State Department and on the National Security Council staff for the past ten years, under both Republican and Democratic Administrations, and has a talent for getting along with both

primarily by Secretary of Defense Caspar Weinberger and CIA Director William Casey, two notable Administration hawks who had found Clark to be a reliable ally. Kirkpatrick's confrontational style at the U.N. and her insistence on U.S. support of "authoritarian" but anti-Communist governments, especially in Central America, have made her a far more vivid and controversial figure than McFarlane.

Reagan values her advice, wanted to advance her and McFarlane while accommodating Clark, and came up with a try-to-please-everybody solution typical of him. How McFarlane and Kirkpatrick will mesh if they do in fact both wind up in more important jobs is an open question. Indeed, the problem of who should be National Security Adviser, in theory at least, was still open enough at week's end to enable some dark horses to be exercised in the fashion Washington touts so enjoy. Three names brought out for that were Brent Scowcroft, who was National Security Adviser to President Ford, Frank Carlucci, a former Deputy Secre-

tary of Defense, and former New York Senator James Buckley, like Kirkpatrick a staunch conservative.

Clark's pending departure from the NSC altered some important equations in the White House. Right-wingers instantly deduced that Clark's transfer will cost them more influence over foreign policy than they will preserve in domestic policy at Interior. Richard Viguerie, a veteran fund raiser for hawkish causes, grumbled that the move "gets a strong conservative anti-Communist out of the foreign policy making process and allows the moderates and liberals in the White House and State Department to assume total control." His view is both biased and wildly overstated, but contains a measure of truth.

None of the people on the short list of candidates for National Security Adviser enjoys Clark's easy intimacy with Reagan. Hardly anyone else in the Administration does. In the long run, only the extremely assertive Kirkpatrick could conceivably have become a strong rival to Shultz for the President's ear. The choice of McFarlane is likely to strengthen Shultz's moderate, pragmatic influence; no matter his considerable merit, he is not the President's confidant.

Shultz has already been making a comeback from midsummer, when he seemed to be in eclipse. For example, he took a front-and-center role in organizing and expressing U.S. and world outrage at the Soviets' shooting down of the Korean jetliner. His renewed prominence has been quietly encouraged by some White House aides—including, oddly enough, Clark—who know that the Administration cannot afford to lose another Secretary of State before the 1984 election.

The impact of Clark's shift may be most noticeable in arms-control policy. Clark generally sided with those officials who place more emphasis on building up U.S. nuclear might than on reaching agreement with the Soviets. His absence will probably strengthen the clout of the so-called arms controllers at State, who favor stronger efforts to limit or reduce nuclear weapons on both sides.

The arms controllers will be especially cheered by the appointment of McFarlane, who is an expert in the field. He is neither a dove nor a mushy compromiser. He is, however, a realist who would join Shultz in seeking to explore any opportunity for an acceptable compromise that might come up in two sets of negotiations with the Soviets in Geneva, one dealing with theater-range nuclear weapons in Europe, the other with intercontinental missiles and warheads. That is, of course,

if the Soviets show any real flexibility—a gigantic if, given the chill in U.S.-U.S.S.R. relations.

McFarlane probably would also be more effective in winning support for Administration foreign and military policy in Congress, a job that the Judge bungled badly. For example, Clark angered even Administration supporters on Capitol Hill by not consulting them in advance about the extensive naval and military maneuvers the U.S. is now conducting around Marxist Nicaragua (he did not inform Shultz about the timing either, to the Secretary of State's consternation).

McFarlane is so highly regarded in Congress that some influential legislators were paradoxically unhappy about his appointment as Middle East envoy. Though they had no qualms about his negotiating ability, the congressional powers thought McFarlane was more valuable helping Clark to run the NSC. They presumably

the words of one Ambassador, as "a professional who knows the issues and is receptive to realistic solutions." They would have been less pleased by the appointment of Kirkpatrick. Her credentials as an Atlanticist were made suspect by her unsuccessful advocacy of U.S. neutrality in the war between Britain and Argentina over the Falkland Islands.

All these potential gains from the transfer of Clark out of a job in which he had become exhausted, however, must be weighed against another consideration: the Administration has never managed to put together a smoothly working apparatus for making foreign policy decisions, and so far the multiple changes of personnel have not produced one that can run for more than a few months without a glitch. It remains to be seen whether the installation of McFarlane at the NSC and a new job for Kirkpatrick, if that should indeed be what Reagan decides, can achieve the desired combination of consistency and flexibility.

There is a chance, though, and it comes at a critical moment. U.S. foreign policy in many respects is in trouble. Relations with Moscow are in a deep and angry frost; the situation in Central America remains precarious; the Middle East as always teeters on the brink of explosion, and for all McFarlane's efforts, U.S. negotiating options seem even slimmer than usual. Yet there are signs of Administration movement toward a more centrist and adaptive approach to foreign policy. In recent weeks

the White House compromised with Congress to win bipartisan support for the continued presence of U.S. Marines in Lebanon and revised its bargaining position on strategic nuclear weapons in order to preserve funding for the MX missile. Reagan also agreed to exchange visits with Premier Zhao Ziyang of Communist China.

A fresh eye at the NSC could speed some further changes, for which the pressure in any case is strong. Like any other President preparing for a re-election campaign, Reagan is eager to dangle some kind of foreign policy success before the voters. The impact of a presidential campaign on foreign policy traditionally is baneful: it often causes every decision to be viewed not on its merits but on how it will affect blocs of voters. But if the campaign prods Reagan and his advisers into a more balanced position, the result just might be a more successful foreign policy.

—By George J. Church. Reported by Laurence I. Barrett and Douglas Brew/Washington



Two on the move: McFarlane in Beirut; U.N. Ambassador Kirkpatrick at home in Virginia

will be equally happy to have him back in the top slot at the NSC.

The appointment of a new National Security Adviser is likely to strengthen U.S. relations with West European allies. The improvement could not have come at a more opportune time: the European governments are about to accept the deployment of NATO missiles on their soil over a storm of angry protest from the international peace movement. The Europeans distrusted Clark from the beginning because of his role in easing out Haig, who was a devoted believer in the "Atlanticist" school of diplomacy, which holds U.S. solidarity with Western Europe to be vitally important. The allies' skepticism deepened as they perceived Clark to be encouraging Reagan in adopting a reflexively anti-Soviet hard line, and the President's announcement of Clark's leave taking was greeted with private relief along Washington's Embassy Row. "It was a nice surprise," said one European diplomat.

The Europeans view McFarlane, in

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CHEMICAL INFORMATION INDEX

ON

1,1,1-TRICHLOROETHANE

Hand nishing'

tant, John O'Brien, was
particular interest in Mr Hand be-
cause there were no issues on which
he might be questioned which were
likely to benefit creditors.

The Nugan Hand issue — which
was reported on by the Stewart
Royal Commission in 1985 — has
been raised also with the offices of
the Prime Minister, Bob Hawke;
the Federal Attorney-General, Mi-
chael Duffy; the NSW Premier,
Nick Greiner; the NSW Attorney-
General, John Dowd; and the NSW
Police Minister, Ted Pickering.
Matters relating to Royal commis-
sions are the responsibility of the
Prime Minister and/or Premier.

The overwhelming lack of inter-
est in Mr Hand is astonishing.

For two years, between 1983 and
1985, Justice Donald Stewart in-
vestigated the group's activities.
While his Royal commission ruled
out any involvement in the CIA or
in drugs and arms-running, it said
the group had committed many
breaches of foreign-exchange regu-
lations, had been involved heavily
in tax-evasion schemes, and had
been involved in other fraudulent
conduct under Commonwealth
and NSW company law.

Justice Stewart did not say pub-
licly who had been responsible for
these offences. That section of his
final report was suppressed.

Despite the judge's findings, not
a single person was charged.

Man 'staggered' by FBI's visit to discuss Nugan Hand's affairs

Despite the finding of the
Stewart Royal Commission
that the Nugan Hand bank
had had nothing to do with
United States Intelligence, the
CIA and the FBI took an ex-
traordinary interest in the af-
fairs of the bank's collapse.

The FBI sent an agent to
Australia to talk to people in-
volved in the investigation of
the bank's affairs. One of those
people has told *The Canberra
Times* that the agent questioned
him about Michael Hand and
his alleged CIA links.

The then director of the
CIA, William Colby, actually
wrote to the person about Mr
Hand and Operation Phoenix
investigations in the US involv-
ing the Irangate scandal.

While detailed investigations
of Nugan Hand's financial af-
fairs failed to disclose any CIA
links, *The Canberra Times's* in-
formant said he had been
"staggered" by a conversation
he had with police at the time;
the Colby letter; and the FBI
visit. He did not expand on the
contents of the conversation
with police.

The man did not think Mr
Hand had been a CIA agent
during his time in Australia —
although he had been a "hatch-
et man" for it in South-East
Asia in previous years — but
had been trying to create an

"aura" by suggesting an associ-
ation. The CIA-FBI ap-
proach after the bank's
collapse had made him wonder
if there was more to it.

Doubts about the official
finding that Nugan Hand had
no links to the CIA is shared
by Brian Toohy, editor of *The
Eye* and a former editor of *The
National Times*.

In the most recent issue of
The Eye, Toohy said Justice
Stewart's findings had ignored
the fact that in an interview
with Australian police, the
CIA's "most famous 'dirty
tricks' operative", Ted Shack-
ley, had admitted freely that
Mr Hand had worked for him
in the CIA in Indochina. Too-
hey pointed out also that many
key Nugan Hand figures had
been shown later to have been
involved deeply in the Irangate
scandal, involving the sale of
arms to Iran to finance Contra
rebels in Nicaragua.

Toohy said a recently pub-
lished book, *Kiss The Boys
Goodbye*, had quoted a former
high-ranking CIA official as
saying that Nugan Hand had
been the vehicle to finance a
covert war in Indochina after
the Vietnam War had ended.

— ROD CAMPBELL

Victoria issues guide to prevent harassment

MELBOURNE: A guide
to prevent sexual harass-
ment in the workplace was
issued yesterday by the
Victorian Government.

Aimed at employers, the
guide provides advice on
how to encourage a pro-
ductive work environment
in which sexual harass-
ment is discouraged.

Issued by the Minister
for Labour, Neil Pope, the
guide details also the steps
employers should take if a
case of sexual harassment
is brought to their atten-
tion.

"Employers should be
aware that sexual harass-
ment is against the law.
Employees have the right
to work in a healthy and
safe workplace, free from
sexual harassment," he
said.

The guide suggests that
employers should draw up
and make widely known a
clear policy that sexual har-
assment will not be toler-
ated in the workplace.

The guide asks employ-
ers also to develop effec-
tive in-house procedures
for resolving complaints of
sexual harassment, includ-
ing appointing a sexual-
harassment counsellor.

A Federal Government
study issued in Sydney on
Friday said that a program

against sexual harass-
ment could not succeed with-
out the commitment of man-
agement, but many manag-
ers were interested. The Af-
fairs Action Agency found
that many employers still
had their eyes to harass-
ment going their work-
places.

Mr Pope said victi-
sexual harassment is
not forced to suffer
degradation in their
resign from their job.

"The law clearly
the onus for prev-
sexual harassment
employer and on su-
pers," Mr Pope said.

Employers are
under the Federal Se-
crimination Act as
Victorian Equal Op-
portunity Act to prevent
harassment in the
place.

As more and
women become a-
their rights, the
sexual-harassment
ies to the Victorian
missioner for
Opportunity is incr-

ELECTROBOARD Colour L.C.D. Panels



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THE Eye

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**Brian Toohey:
new light on
WA Inc.**

**We find
Mike Hand's
hide-out**

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THE CONTRAGATE LAWSUIT

North spies on Institute

Secord and North allocate \$130,000 for investigation

Retired Air Force Maj. Gen. Richard V. Secord diverted \$130,000 from a secret Swiss bank account to pay for a covert investigation of the Christie Institute, according to reports by the *Washington Post* and Congressional sources.

At the same time, Marine Lt. Col. Oliver North set in motion an F.B.I. investigation of the Institute. The bureau closed the investigation when it could find no evidence to support North's suspicions that the Institute was supported by foreign powers.

In a related development, a Federal grand jury is now exploring allegations that Secord and North organized a covert operation to spy on United States citizens.

The attempt to use a Government agency and a retired C.I.A. operative to discredit the Institute reflected the fear, which Secord admitted to a Congressional investigating committee, that the Institute's lawsuit might "knock out" secret military aid to the *contras*.

The Swiss account, which Secord controlled, was a depository for profits from the illegal sales of weapons to Iran and other secret funds destined for the *contras*. The former general is one of 29 defendants in the Institute's lawsuit against the "secret government" which organized covert support for the *contras*. North is not a defendant.

In December, the *Wall Street Journal* reported that the special prosecutor investigating the Iran-*contra* scandal, Lawrence Walsh, had decided to ask a grand jury to explore allegations that Secord and North "ran an illegal domestic spying operation targeted at some Reagan administration critics." According to Christie General Counsel Daniel Sheehan, the new investigation will probably center on Glenn Robinette, a former official of the Central Intelligence Agency hired by Secord to dig up "derogatory information" about the Institute.

Robinette, Sheehan said, is a 30-year veteran of the C.I.A. who specialized in electronic surveillance, including wiretapping, and the preparation of forged documents. The Institute has obtained a copy of Robinette's business calendar, which shows that the private investigator met frequently with Secord and other defendants named in the lawsuit.

"The alleged decision by a senior Administration official to spy on United States citizens may become a far greater scandal than the sale of weapons to Khomeini," Sheehan said. "It's a warning that no United States citizen is safe from a single Government official obsessed with national security. The full truth has to come out on this."

According to the final report of the House and Senate committees investigating the Iran-*contra* scandal, North tried to use information from Secord's investigation to discredit

NEW WATERGATE

The Watergate scandal originated in the Nixon Administration's determination to protect the secrecy of plans, concealed from Congress, to escalate the war in Southeast Asia. When leaks threatened to expose these covert operations to the public, the White House created a "plumber's unit," an illegal team assigned to spy on Government officials, journalists and other United States citizens.

In early 1986 Lt. Col. Oliver North and retired Air Force Maj. Gen Richard Secord organized a similar operation to investigate and discredit the Christie Institute. The justification: The Institute's Federal racketeering lawsuit threatened to "knock out" the secret operation to aid the *contras*, Secord told the *Washington Post*.

"The Christie Institute," Democratic Congressman Richard Gephardt said late last year, "was targeted by Oliver North because it was close to the truth. We may still not know the whole story, but the American people owe a debt of gratitude to all those who helped expose the illegal acts of the Iran-*contra* affair."

Other attempts to discredit the Institute reflect a sense of desperation as the defendants' trial date nears. In Costa Rica, *contra* agents in the narcotics police attempted to frame the Institute and its plaintiffs on cocaine charges. And in the right-wing press, the Christie Institute has been transformed into a shadowy conspiracy run by foreign governments. See the stories on this page and pages four and five for further details. □

one of the key sources for the Institute's lawsuit.

Secord paid Robinette more than \$60,000 to "investigate the backgrounds of those behind the Christie lawsuit," according to the *Post*. The retired general told the newspaper he feared the lawsuit could expose the secret military supply operation for the *contras*, and therefore considered the payments a legitimate business expense.

In June, Robinette told Congressional committees investigating the Iran-*contra* affair that his assignment was to obtain "derogatory" information on the plaintiffs and attorneys in the lawsuit. Robinette said he paid \$7,000 to informants during a trip to Costa Rica in November, 1986. The former C.I.A. official's trip came shortly after the first press reports of the secret arms sales to Iran, but several months after the Institute filed its lawsuit against Secord and other figures in the secret *contra* supply operation.

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NORTH INVESTIGATES

■ *continued from page 3*

Sheehan said he does not know if the "derogatory information" supplied by Robinette to Secord includes suspicions voiced by North and Secord that the Institute's lawsuit was based on information supplied by "foreign intelligence sources." These charges have recently been repeated by various extremist groups linked with the defendants, along with allegations that the Institute cooperates with "Marxist-Leninist organizations" and that the Institute operates from the Nicaraguan foreign ministry in Managua.

Secord told the *Post* in June that the Institute's lawsuit was "an outrageous fairy tale," but that he feared the legal action might "knock out" the secret operation to supply the *contras* with weapons and military supplies. In addition to the \$60,000 allocated for Robinette's investigation, Secord told the *Post* that he used funds from the Swiss account to pay Shea and Gardner, a Washington law firm representing Adolfo Calero, the *contra* chief and a co-defendant in the lawsuit. The firm, which failed to convince a Federal judge to expel Sheehan from the case on the grounds that he testified before Congress, no longer represents Calero. According to Calero's current attorney, Secord's payments to the lawyers added up to \$45,000.

The special prosecutor's investigation of Secord and North raises the possibility that the two men may have organized a "plumber's" unit, an illegal operation inside the Government

to spy on United States citizens. The original "plumbers" were private investigators hired by White House aides during the Nixon Administration to investigate political opponents. Although law firms and journalists may investigate individuals, provided their activities are within the law, it is illegal for a Government official to organize a private investigation of political opponents or to arrange for electronic surveillance without a court order.

After the lawsuit was filed in May 1986, North contacted the F.B.I. to urge an investigation of Martha Honey and Tony Avirgan, the two plaintiffs who have charged Secord and the other defendants with a conspiracy to violate United States neutrality, banking, currency and arms export control laws. North told Oliver Revell, the FBI's chief of criminal investigations, that he suspected the two plaintiffs "were probably being funded or supported by the Sandinistas," according to the Congressional report. Revell replied that "the FBI did not engage in that type of investigation," the report said.

But sources close to the F.B.I. have told the Institute that the bureau did investigate North's suspicions that the Institute was an agent of a foreign power, dropping the matter when no evidence supporting the charge was found.

In June 1986, the report reveals, North met again with FBI agents and complained that the bureau had failed to investigate Daniel Sheehan. When the bureau failed to act, the report says, "North ultimately hit on a better formula, however, with Secord's assistance." □

DRUG FRAME-UP

■ *continued from page 4*

known in Costa Rica. During a visit in January 1987, he was arrested by narcotics police in San Jose and held for several hours without charges. After a lengthy interrogation, the police attempted to deport him to the United States, although they had no authority from a court to do so. Father Davis resisted deportation and met the next day with President Oscar Arias of Costa Rica, who apologized for the incident. Davis was in Costa Rica at the time as an officer of the Federal Court, attempting to serve subpoenas on defendants named in the Institute's lawsuit.

Davis believes he is supposed to be the "Reverend" who, according to the fictitious letter, told the writer "that there were only 400 kilos of quality not like the sample we received from Bolivia." "The other characters are pretty obvious," Davis said. "The 'commandantes' are supposedly the leaders of the Nicaraguan Government and the 'Institute' is the Christic Institute.

"J.K.' is probably meant to be Senator John Kerry of Massachusetts, who leads a Congressional investigation of *contra* drug-trafficking and therefore has been a major headache for the 'freedom fighters,'" Davis explained. "Humberto" is Humberto Ortega, Nicaragua's Minister of Defense, and 'Daniel' is his brother, the President of Nicaragua. 'Pavlov' is the Soviet Ambassador to Costa Rica, Yuri Pavlov, and 'Lic. Castro' is Otto Castro, the Costa Rican attorney for Martha and Tony. *Lic.* is the Spanish abbreviation for attorney."

After the package was opened, Judge Araya accompanied

several police agents to the Avirgan-Honey home, which they searched despite objections raised by Christic Institute attorneys. Araya permitted one C.I. attorney to accompany each team of officers on their search. "We insisted, for the obvious reason that they could try to plant more drugs if they were unobserved," said Davis.

The search revealed nothing, but police kept Carmen Araya in custody, ignoring the judge's instructions that she could not legally be held. Police also handcuffed and arrested Christic attorney Tom Kellenberg when he protested their actions.

The secretary was released that evening. Charges against her, used by police as an excuse for her arrest, were never mentioned again. Kellenberg was held overnight and charged the following day with failing to show proper respect for a police officer. A Costa Rican court dismissed the charge in July. Charges relating to the package of cocaine were never filed.

It is still not known why Avirgan and Honey were framed on a narcotics charge. The story of a drug-smuggling "Reverend" working with the highest officials in the Nicaraguan Government was too bizarre for the North American press, which ignored the incident. But the arrests had political uses in Costa Rica. At the time of the incident, President Arias was out of the country. On May 13, the day following the arrests, Legislative Assembly President Fernando Volio spoke on national radio, demanding the expulsion of Avirgan and Honey within 24 hours. Volio is a leader of Costa Rica's extreme political right, which supports the *contras* and opposes President Arias' attempts to steer a middle course between the Nicaraguan and United States governments. □

Washington's Proxy:

Israeli Arms in Central America

by Clarence Lusane *

Editors' Note: This article first appeared in CAIB Number 20, Winter 1984. Israel has remained an important conduit for military training and arms on behalf of the U.S. Israel was a crucial supplier of weapons to the Nicaraguan contras after Congress prohibited Reagan from sending military aid. They continue to supply the Guatemalan military as it wages a brutal counterinsurgency war against the Guatemalan people.

The war drums are beating in Central America and Israel is an important player. The State of Israel has emerged as a major, and in some cases, principal, supplier of arms, advisers and training to the repressive forces in the region. Long denounced for its military ties to South Africa, Chile, and the Philippines, the Zionist regime has extended its role as surrogate for the U.S. to the front line of Central America. Although much of what is happening is held in strict secrecy, the vast extent of Israeli aid has begun to fray the cover under which Reagan administration policy objectives circumvent Congressional obstacles.

As this article will show, stopping U.S. military aid to Central America also requires stopping U.S. military aid to Israel. The information presented only scratches the surface of what is probably the key link in U.S. foreign policy under the Reagan administration. By the end of the 1960s Israel had emerged as an arms exporter, but only since the Reagan administration has it been able to reach its potential as a full junior partner to U.S. imperialism.

The Israeli Arms Industry

Fourteen percent of Israel's industrial labor force is employed in its arms industry. If the armed forces are included, the number rises to 25%.

According to the latest CIA estimates, Israel is the fifth largest exporter of arms in the world. This is up from its seventh place ranking in 1980. Israel remains the largest supplier of arms to sub-Saharan Africa and Latin America.

In 1977, Israel's arms exports were valued at \$285 million. Despite the loss of two reliable customers, Iran and Nicaragua, by 1981, military exports had risen to \$ 1.3 billion. Since 1970, Israel's military budget has consumed more than 30% of its national budget. Limited domestic use has made the export of arms essential to its economic survival. Latin American money has become indispensable to the Israeli arms industry.

It must be pointed out that Israel's goals are political as well as economic. Stability of the current and international politi-

cal order is a chief objective of Israeli foreign and military policy. In country after country, we can observe how Israeli arms sales meet these twin aims.

Honduras

In 1982 Israel's then Defense Minister Ariel Sharon arrived in Honduras for a 38-hour visit. Sharon and the Hondurans agreed that Israel would send Honduras 12 Kfir planes, radar equipment, light weapons and spare parts and 50 advisers. Military training was also proposed. Incidentally, upon leaving Honduras, Sharon flew to the U.S. AFP, the French News Agency, observed the deal "could intensify the danger of unleashing an arms race in the region."

Less than six months later, the *New York Times* reported on its front page that Israel was sending weapons to Honduras. Much, if not all, of these arms were to go to U.S.-backed counterrevolutionaries seeking to overthrow the Nicaraguan government from bases in Honduras.

It was also reported that the Honduran Armed Forces Commander, Gustavo Alvarez Martinez, visited a CIA training facility in Virginia earlier this year to examine captured PLO weapons. Israel has stated that it would provide captured weapons to any Central American military government for only the cost of transporting them.

The estimated \$25 million in weapons promised to Honduras by Sharon is a continuation of past practice. However Honduras is now playing a new role in Central America, similar to the one Israel plays in the Middle East. It has become strategically important to U.S. interests and goals in the region. As a rear base for the *contras* attacking Nicaragua, and as a training ground for Guatemalan and Salvadoran fascists, Honduras must be armed. Determined not to be inhibited by congressional or public opinion, the Reagan administration has given the Israelis the go-ahead in Honduras. In addition to aid from the U.S. and Israel, Honduras has received military aid from Argentina and Chile, allowing it to increase its armed forces six-fold since 1970 (from 5,000 to over 30,000). The Honduran Air Force is the most powerful in Central America.

U.S. officials have admitted that Israeli assistance is important in achieving Reagan administration military and political goals. Worried about potential congressional locks on aid to the Nicaraguan *contras*, the administration wants to be sure supply lines are not disturbed. U.S. military aid to Honduras will go toward buying weapons from Israel which have themselves been produced with U.S. military aid.

It is the goal of the U.S., with the critical assistance of Israel, to make Honduras the chief gendarme of Central

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America. The second poorest nation in the region (behind Haiti) will continue to buy arms from Israel at the expense of its own people. Like its neighbors in El Salvador and Guatemala, Honduras increasingly violates the human rights of its citizens with the helping hand of Israel. There is one central objective in the U.S.-Honduras-Israel connection. If the conditions ripen to where U.S. policy makers launch an all-out invasion of Nicaragua, it will duplicate the Israeli invasion of Lebanon, except that it will be launched from Honduran soil.

El Salvador

From his first days in office, Ronald Reagan pledged to draw the line against communism in El Salvador. The murderous and corrupt Salvadoran junta, a politically split U.S. Congress, and the superior fighting capacities of the FMLN guerrillas have turned out to be difficult obstacles.

In 1981 when the Administration was scrambling to find more aid to send El Salvador, Israel agreed to "lend" the U.S. \$21 million to give El Salvador. Money which came from previous U.S. aid to Israel. In other words, the U.S. cynically took out a loan on its original funds, thereby violating the expressed will of Congress.

The U.S. has only recently become a major supplier of military aid to El Salvador. Through all of the 1970s, Israel was the biggest seller of weapons and aircraft to the country. This arsenal made up more than 80% of El Salvador's military imports during the period. It has been supplemented by an estimated 100 Israeli advisers (almost twice the official number the U.S. claims to have). These advisers, like their U.S. counterparts, are training the Salvadoran military in counterinsurgency strategy and tactics at a secret base near Tegucigalpa.

In addition, Israeli pilots are believed to be flying Israeli made aircraft against the guerrillas. El Salvador has the infamous distinction of being the first Latin country to receive these advanced combat fighters.

Israel has also set up advanced computer systems to gather and analyze intelligence about the citizenry. Similar to the Israeli-installed computers in Guatemala, the network in El Salvador also monitors changes in water and electricity consumption.

All Israeli aid to El Salvador comes from American military and economic aid to Israel. It has been noted that some of the most vocal congressional critics of Reagan policy objectives in El Salvador are also unquestioning supporters of aid to Israel.

Somoza's Nicaragua

Until the very end, Israeli arms poured into Somoza's Nicaragua. After the cold-blooded killing of journalists by Somoza's National Guard in 1978, President Carter cut off all U.S. aid to Nicaragua. Israel, bolstered by U.S. aid to it, picked up the slack and until July 2, 1979, just two weeks before the Sandinistas won the final battle, provided 98% of Somoza's arms.

When questioned about selling arms to Somoza, Israeli

Prime Minister Menachem Begin responded, "We have a debt of gratitude with Somoza." In 1948, the U.N. General Assembly recommended the partition of Palestine and the creation of a Jewish state. The new State of Israel needed weapons and had almost nowhere to turn. Israel struck a deal with Somoza. Somoza appointed Yehuda Arazi as a Nicaraguan Ambassador to Europe where he could purchase weapons in the name of Nicaragua. Eventually, all the weapons ended up in Israel. All of this was accomplished for a mere \$200,000. Arazi, it turned out, was a member of the Jewish underground's clandestine army organization, Haganah.

Guatemala

The U.S. is not the primary supplier of arms to Guatemala. Since 1976, Israel has been the main provider of weapons, aircraft, and training to Guatemala. Between 1977 and 1981, after the U.S. cut off aid due to gross human rights violations, Israel was the only nation giving military aid to the regime.



Israel supplied Somoza's National Guard with military equipment and training.

Training of Guatemalan military strongmen by Israel has included education in the use of terror and interrogation techniques, modern intelligence methods and psychological warfare. Israeli advisers are the key link in Guatemalan counterinsurgency operations. From national planning to civilian rural cooperative programs to military maneuvers, Israel is centrally involved.

Israel's connection to the repressive forces of Guatemala are hardly secret. Israeli advisers have trained many of the officers of Guatemala's police intelligence (G-2). In reference to the guerrillas fighting the ever-changing military juntas which have come to power, the right wing openly calls for the "Palestinianization" of the rebelling Mayan Indians.

As with Somoza, Guatemala's relationship to the Zionist state goes back to 1948 when Israel was created. One of the three U.N. Commissioners overseeing the establishment of Israel was from Guatemala. Despite the numerous changes in power in Guatemala over the years, it has remained a consistent and staunch supporter of Israel.

Today, Guatemala-Israel relations are better than ever. Extensive trade and economic agreements have been signed recently. First and foremost, however, Israel's relations with

Guatemala are military. Some of Israel's most advanced electronic and computer technologies have been installed in Guatemala. Hit lists used by the death squads have been computerized. Technologically sophisticated murder is coordinated by a Regional Telecommunications Center (RTC) built and managed by Israeli Army experts. The RTC is also linked to the U.S. Army's Southern Command at Fort Gulick in the Panama Canal Zone. The RTC is run by the generals from the fourth floor of the National Palace Annex.

The U.S. Agency for International Development has said that the RTC is Guatemala's principal presidential level security agency and works with a high level security network. AID claims that it links the key officials of the National Police, Treasury Police, Detective Corps, Ministry of Government, the Presidential Palace, and the Military Communications Center.

The Tel Aviv newspaper *Haolam Hazeh* and the London *Guardian* revealed in December 1982 that Israeli advisers work closely with Guatemala's G-2 police units in the use of interrogation and torture. In this activity, they work closely with Argentina and Chile.

Computerized death lists are a mainstay of government terror and inspired a "spy-on-thy-neighbor" campaign. By 1980, computers already listed 80% of the Guatemalan population.

In November 1981, the Israeli-sponsored Army Electronics and Transmission School was opened in Guatemala. Its purpose is to teach computer and electronic monitoring of the Guatemalan people. Equipment at the school is capable of doing everything from checks on potential apartment renters to detecting changes in electricity consumption that supposedly might indicate that an illegal printing press is in operation.

Israel has also been helpful in developing Guatemala's major military-civilian programs. The Guatemalan military has attempted to create Vietnam-style strategic hamlets. The means of implementing these counterinsurgency plans were couched in terms of establishing peasant cooperatives similar to the kibbutzim in Israel. Guatemalan and Israeli agricultural and military officials were exchanged and it soon became apparent that the goals of the program were to crush peasant support and participation in the armed struggle.

The U.S., becoming involved through AID, sent "experts" and provided credits and grants. These civic programs were to take place in the Ixcán area. This is the major base of support for the Guerrilla Army of the Poor (EGP), one of the major rebel forces fighting to overthrow a succession of repressive governments.

Under the recently overthrown Rios Montt regime, the Israeli model was put into full operation. In August 1982, a "Plan of Assistance to Conflict Areas" (PAAC) program was begun. The PAAC program reproduced many of the tactics applied by the Israelis on the West Bank, such as finding mayors willing to accommodate to the status quo.

Some of Israel's most advanced electronic and computer technologies have been installed in Guatemala. Hit lists used by the death squads have been computerized.

Costa Rica

Costa Rica's northern border has become an operational base for attacks by *contras* on Nicaragua. Former Sandinista, Eden Pastora, leads a small army estimated at 5,000 from this

border area.

At one point, Pastora claimed that he had to shut down his activities because he had run out of funds. He stated that because of his "anti-U.S." stance, he would not accept funds from the CIA. Within days he was fighting again, reportedly with an infusion of funds from Israel, as well as other countries. In fact, much of this was a propaganda charade, as Pastora has been receiving CIA aid all the time.

Although Costa Rica has no army, Israeli military trainers and arms are beginning to pour into the country. In 1982, President Luis Alberto Monge met with Menachem Begin in Washington. They discussed the possibility of Israeli military aid in building up Costa Rican security forces. The funds would come from Washington.

Israel has been chosen by AID to build a \$10 million settlement project along the Nicaragua-Costa Rica border. The military squeeze that the *contras* are currently operating from Honduras and Costa Rica would obviously be enhanced should the U.S. Congress fund this proposal.

The U.S. Role

Has exposure of illegal arms transfers by Israel forced the U.S. to cut back on aid? Or has the fact that Israel has sent arms to countries which the U.S. Congress and others have designated as flagrant violators of basic human rights made the Reagan administration voice any criticism of Israel? The answer to both questions is no.

Relative to its size and needs, the immense scale of continued U.S. military and economic aid to Israel is obscene. Even after last summer's internationally condemned invasion of Lebanon, Israel remains the largest recipient of U.S. foreign aid. It receives about one-third of all U.S. foreign aid, which in the last 10 years has amounted to about \$25 billion.

Even more shocking, since 1976 Israel has not spent a penny of its own for military imports. The average U.S. subsidy to Israel for military imports has been 129% of the actual cost of those imports.

In the current fiscal year, Israel will receive \$785 million in economic assistance and \$1.7 billion in military aid. It will receive the same amounts in the fiscal year which began October 1, 1983. Israel's Defense Minister, Moshe Arens, was in Washington in late July to discuss more military aid and the right to use U.S. aid to develop weapon systems that are currently only available in the U.S.

The above figures shed light on the important and central role that Israel plays in U.S. foreign policy goals. No amount of struggle against U.S. aid to repressive dictatorships and juntas will be complete, or even marginally successful, unless Israel is also taken to task. ●

Was the CIA Involved?

The Bombing of Pan Am 103

by Jeff Jones*

Pan Am 103, the jumbo jet that blew up over Lockerbie, Scotland on December 21, 1988, might have passed into history as simply another example of the tragic loss of life spilling out of the Middle East conflict. But, as with other incidents of this kind, the official investigation leaves questions unanswered. Many relatives of the victims—the plane's 259 passengers, and 11 people on the ground—fear that the full truth will never be known.

By most accounts, investigators believe the crash was caused by a sophisticated bomb—with a time-delay, barometric fuse—placed on the plane by Ahmed Jibril's Popular Front for the Liberation of Palestine-General Command (PFLP-GC), a Syrian-backed group that rejects PLO efforts to negotiate with Israel.

Flight 103 originated at Frankfurt and continued on, with another plane, from London. The bomb detonated at 7:03 p.m. If it had gone off just 10 minutes later, the Pan Am clipper would have already crossed the Scottish coast and the plane—its victims and evidence—would have vanished in the North Atlantic. Jibril has denied responsibility for the attack. But investigators believe that the PFLP-GC received a large payment from Iran—ABC News has reported \$10 million—to carry out the attack to avenge the U.S. downing of an Iranian airbus in which nearly 300 people died on July 3, 1988.

Paul Hudson, an Albany, New York lawyer, is the president of Families of Pan Am 103/Lockerbie, one of three groups made up of relatives of the victims. Paul and Eleanor Hudson's 16-year-old daughter Melina was returning home from a year of school in England when she died in the crash. "Anything that will prevent a coverup,...that will keep others from experiencing what we have, is important," Eleanor Hudson said recently. "The full truth should come out," Paul Hudson agreed. The charge of cover up does not come easily to either Eleanor or Paul. But Paul Hudson, who has followed the investigation closely, is dismayed at its progress. "It appears that the government either has the facts and is covering this up," he said, "or doesn't know all the facts and doesn't want to."

Many Questions

Most of the initial controversy surrounding Pan Am 103 focused on the U.S. government's long standing policy of not informing the general public when an airline, an air-travel corridor or a specific flight has been threatened by terrorist attack. Pan Am 103 fit in to all of these categories. But there are many other questions percolating just beneath the surface of

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the investigation:

- There were, it is now known, at least four, and, according to one unsubstantiated report, as many as eight, CIA and other U.S. intelligence agency operatives returning from Beirut, Lebanon, aboard the plane. The Lockerbie bomb crippled U.S. intelligence efforts in the Middle East. Were the intelligence operatives on 103 the bomb's target?

- A CIA team headed for Lockerbie within an hour of the crash.¹ At least once during the ground search, CIA investigators wore Pan Am uniforms; and according to one unrefuted allegation, CIA operatives temporarily removed a suitcase from the site that belonged to one of their agents, thereby breaking the Scottish police investigators, "chain of evidence," which could be crucial to any successful prosecutions.

- Also aboard Pan Am 103 was Bernt Carlsson, the Swedish U.N. diplomat, who had just completed negotiating the Namibian independence agreement with South Africa. He was due in New York the next day to sign the agreement.

- In October 1988, the West German Federal Police, the Bundeskriminalamt (BKA), raided a suspected terrorist safehouse. During the raid, they found a bomb—hidden in a Toshiba radio—that was virtually identical to the one believed later to have brought down Pan Am 103. All but one of the 16 people arrested were soon released and several of them are now top suspects in the bombing.

- Pan Am was fined more than \$600,000 by the U.S. Federal Aviation Administration (FAA) for lax security at its baggage-handling facility in Frankfurt. And according to the West German newsweekly *Stern*, a Pan Am security official in Frankfurt was spotted after the crash backdating a copy of a crucial FAA memo. The memo described a call placed to the U.S. Embassy in Helsinki in which the caller reportedly warned that a bomb would be smuggled onto a Pan Am aircraft flying from Frankfurt to the United States.

- The most startling and controversial charge to surface around Pan Am 103 comes from a report issued by a little-known New York City-based intelligence group called Interfor, Inc.² The company was hired by the law firm representing

1. Steven Emerson and Brian Duffy, *The Fall of PanAm 103* (New York: Putnam's, 1990), p. 41.

2. According to Daniel Aharoni, Interfor's general counsel, the 10-year-old company is engaged in "private intelligence and security" for corporate clients. From time to time, Aharoni said, Interfor conducts "overseas investigations on particular measures, including counterterrorism." Juval Aviv, the company's founder and president and a former member of Mossad, authored the controversial report.

Pan Am's insurance agents to find out what happened. The Interfor Report was leaked to the press last fall.³ Its immediate impact was to stall, indefinitely, the approximately 300 civil court cases filed against Pan Am by relatives of the victims. Interfor has charged that a rogue CIA unit in Frankfurt, seeking to make a deal for the release of U.S. hostages in Beirut, was protecting a Middle East heroin smuggling operation being run through Pan Am's Frankfurt baggage operation. The fatal bomb, according to this allegation, was placed on the plane in a suitcase substituted for one that normally would have contained contraband.

- But according to a January 1990 report on Frontline, the PBS news program, the bomb was placed on the plane at London's Heathrow Airport when a baggage handler switched suitcases belonging to CIA officer Matthew Gannon. Frontline believes the planning for the retaliatory bomb attack was already under way when the group learned that several top U.S. intelligence officers would be flying Pan Am 103 out of London's Heathrow Airport. Gannon and two other operatives, having left Beirut by separate routes, may have made a fatal error when they purchased their plane tickets over-the-counter from a travel agent in Nicosia. According to Frontline, the only piece of luggage not accounted for from the flight belonged to Gannon. Frontline's investigators believe that the intelligence officers were "a strong secondary target" and that a suitcase identical to Gannon's was switched at Heathrow.

- And according to syndicated columnist Jack Anderson, President George Bush and British Prime Minister Margaret Thatcher held a transatlantic phone conversation some time last year, in which they agreed that the investigation into the crash should be "limited" in order to avoid harming the two nations' intelligence communities. Thatcher has acknowledged that the conversation took place, but denied she and Bush sought to interfere with the investigation.

The Interfor Report

The controversial Interfor Report maintains that a Frankfurt-based CIA team was protecting a heroin smuggling operation in hopes of obtaining information about U.S. hostages in Lebanon—the same hostages that sparked the Iran/contras arms-for-hostages scandal.

The report claims that the drug smuggling ring is headed by Syrian Monzer Al-Kassar, and controls at least one Pan Am baggage handler at the Frankfurt airport. The handler was responsible for switching luggage that had already been inspected with identical pieces holding contraband. A pas-

3. According to several sources, ex-CIA agent Victor Marchetti got hold of the report and gave it to Congressman James A. Traficant Jr. (Dem.-Ohio), who released parts of it to the media. Another copy of the report turned up in the hands of a West German paper affiliated with the Lyndon LaRouche network.

The bomb was placed on the plane at London's Heathrow Airport when a baggage handler switched suitcases belonging to CIA officer Matthew Gannon.

senger accomplice would then pick up the bag upon its arrival in the U.S. Interfor admits it does not know how the bags passed through customs on arrival, but insists in its report, that "this route and method worked steadily and smoothly for a long time."

Al-Kassar is a known arms and drug smuggler who had received money from two Iran/contras

figures, Albert Hakim and Richard Secord, to buy 100 tons of small arms for the Nicaraguan contras. According to the report, he was also the go-between for a French effort in May 1988 that gained the release of French hostages in Lebanon in exchange for an arms shipment to Iran. Al-Kassar was spotted by the CIA team in Frankfurt which, knowing he had close ties to Syria's chief of intelligence, "...approached Al-Kassar and offered to allow him to continue his drug smuggling routes...if he helped arrange the release of the American hostages."

The Interfor Report says that the CIA group in Frankfurt, although it had contact with the West German BKA and the U.S. Drug Enforcement Administration (DEA), operated to some extent as "an internal covert operation, without consistent oversight, à la Oliver North." In the days before the attack on Flight 103, the report states that Al-Kassar learned that a bomb was going to be placed on the plane by Jibril's Popular Front. On the day of the flight, a BKA surveillance agent assigned to watch baggage being loaded "...noticed that the 'drug' suitcase substituted was different" from those used in previous shipments. He phoned in a report to his superiors "saying something was very wrong."

The BKA relayed the information to the CIA unit, which reported to its control in Washington. The report alleges that "Control replied: Don't worry about it, don't stop it, let it go." The CIA in Frankfurt did nothing to prevent the plane from taking off, because the team "did not want to blow its surveillance operation and undercover penetration or to risk the Al-Kassar hostage-release operation." The report postulates that the CIA assumed—incorrectly—that West German authorities, who were also watching the flight, would intervene.

The Interfor Report also explains why a special U.S. hostage rescue team was on board Pan Am 103 when it was destroyed. According to the report, the team, led by Army Major Charles McKee, had learned that the CIA unit in Frankfurt was protecting Al-Kassar's drug pipeline. McKee reported to CIA headquarters he feared "...that [his team's] rescue [operation] and their lives would be endangered by the double-dealing."

When CIA headquarters did not respond, the McKee team decided to return home without permission. The Interfor Report states that "their plan was to bring the evidence back to the United States [of the CIA's involvement with Al-Kassar and drug dealing] ...and publicize their findings if the government covered it up." Agents connected to Al-Kassar

through Syrian intelligence saw the McKee team make their travel arrangements back to the U.S., and, according to the report, Al-Kassar informed his Frankfurt CIA protectors of McKee's plans.

Following the leak of the Interfor Report, Pan Am went before the federal judge hearing the civil suits against the airline and asked that he subpoena the CIA, FBI, DEA, and State Department in an effort to verify Interfor's findings. The government moved to quash the subpoenas on national security grounds. The Justice Department then took the case out of the hands of its local attorneys by sending a team from Washington to handle the litigation. A ruling is still pending.

Who Was Warned?

There is also considerable controversy surrounding a warning the U.S. government received about a possible plane bombing but never made public. A notice, reportedly based on a tip called into the U.S. Embassy in Helsinki, Finland, was posted in the U.S. Embassy in Moscow and elsewhere—including electronic bulletin boards—where it could be seen by government officials.

The State Department now calls the threat a "hoax." But the FAA took it seriously enough at the time to issue one of its rare security alerts, an alert that was in effect on the day Flight 103 went down. The Pan Am jet, travelling the crowded Frankfurt-London-New York City corridor four days before Christmas, was only two-thirds full. Many relatives of the victims are convinced that this was because government employees avoided the flight.

One official who didn't avoid the flight was Bernt Carlsson, the Swedish U.N. diplomat who successfully negotiated the Namibia accord which led to free elections and a SWAPO-led government in the former South African colony. Carlsson was due at the U.N. the day after the crash to sign the agreement. "Pik" Botha, the South African Foreign Minister, had also been scheduled to fly on Pan Am 103 but he switched his reservation, avoided the flight, and was in New York for the signing.

According to Sanya Popovic, Carlsson's then fiancée, Botha acknowledged at the time that he had been advised to switch planes. Popovic believes that the U.N. also received the warnings about the flight, but that Carlsson was never informed.

The President's Commission on Aviation Security and Terrorism issued its report—not on who was responsible for the bomb, but what, if any, changes should be made in airline security—in mid-May 1990 (see sidebar). The FBI and Scotland Yard have been cooperating with Scottish police (in whose jurisdiction the plane crashed). Their final report will be released in June 1990.

The primary reason that the PFLP-GC is suspected of planting the fatal device, has to do with the similarity between the Pan Am bomb—probably consisting of Semtex, a Czechoslovakian-made plastic explosive hidden in a Toshiba radio—and a bomb found by the BKA during an October 1988 raid on a PFLP-GC safe house in Neuss, West Germany.

That raid, carried out as part of an undercover BKA sur-

veillance operation code-named Autumn Leaves, left West German officials facing intense criticism. Of the 16 people they rounded up, all but one were quickly released from jail. And some of those released are now suspects in the Lockerbie bombing. (The West Germans were further embarrassed when, nearly three months after the Pan Am bombing, several more similar bombs turned up during a subsequent BKA search of the Neuss safe house.) There are enough apparent mistakes and lapses in the West German handling of Autumn Leaves to argue that the bungled investigation allowed the bombers to slip through police hands.



Credit: Associated Press

Bernt Carlsson (right), U.N. Commissioner for Namibia, was killed in the PanAm 103 bombing.

That was the impression conveyed in a recent *New York Times Magazine* story on Pan Am 103.⁴ The article, edited from a new book, *The Fall of Pan Am 103*, by Steven Emerson and Brian Duffy, focused entirely on the West German police and neglected to mention many of the questions that have troubled reporters and families of the crash victims. The article did not even mention the presence of the CIA personnel on the plane, or describe any of the subsequent CIA actions at the crash site.

The *Times* version of the story surprised Duffy, an assistant managing editor of *U.S. News & World Report*. The book goes into "great detail" about who the CIA officers were, Duffy said. "If the book has news value, it rests in part on our conclusions on who the intelligence officers were and what they were doing." He too was surprised that the *Times* editing of the story focused solely on the West Germans.

In fact, the Emerson/Duffy book is long on speculation and

4. Steven Emerson and Brian Duffy, "Pan Am 103: The German Connection," *New York Times Magazine*, March 18, 1990. An Associated Press wire story on the *Times* article appearing in the *Las Vegas Review-Journal*, March 18, 1990 was headlined, "Book: German bungling allowed jet bombing."

The President's Commission

The President's Commission on Airline Security and Terrorism issued its report on May 15, 1990, leaving many questions about the bombing of Pan Am 103 unanswered. But it did make a series of recommendations, including that the U.S. should be more willing to attack suspected terrorists and the states that harbor or support them. "National will and the moral courage to exercise it are the ultimate means for defeating terrorism," the Commission says.

The report calls for government officials to become more vigorous in "planning and training for preemptive or retaliatory military strikes against known terrorist enclaves in nations that harbor them." "Rhetoric," the report maintains, "is no substitute for strong, effective, action."

Threatening military action may be a cynical means for dealing with the anger of relatives of the victims. In April 1989, during a meeting with representatives of the relatives, Bush reportedly offered the unsolicited statement that if "the fingers [of guilt] point to state terrorism," there would be a retaliatory strike like the one the Reagan administration launched against Libya.

Beyond the grandstanding, the report focuses serious criticisms on the Federal Aviation Administration (FAA). The Commission found the FAA to be "a reactive agency—preoccupied with responses to events to the exclusion of adequate contingency planning in anticipation of future threats."

In all, the report contained more than 50 specific proposals designed to improve airline safety and thwart terrorist attacks. Some of the proposals will go to the President as recommendations for action by executive order, while others will be introduced in Congress.

And while it was not included in the Commission's report, the FAA was clearly inclined to meet at least one demand voiced by the victims' relatives: On May 10, an FAA spokesman announced that Raymond Salazar, its director of civil aviation security since 1986, would be leaving his post to become the director of the FAA's Center for Management Development in Palm Coast, Florida. An FAA spokesman claimed the move had nothing to do with criticisms arising from Pan Am 103.

According to the executive summary of the nearly 200-page Commission report, the bomb was "probably" placed aboard at Frankfurt. The summary also states that "a partially filled, unguarded baggage container... was later loaded on the flight at Heathrow." That container, according to Commission head Ann McLaughlin, sat unattended for at least half an hour. "The international criminal investigation has not yet determined precisely how the device was loaded onto the plane," the report says.

While the Commission harshly criticizes both the FAA and Pan Am, it lets the U.S. intelligence community off the hook. "The Commission's review showed that no warnings specific to Flight 103 were received by U.S. intelligence agencies from any source at anytime," it reports. And it repeats testimony presented to the Commission by the CIA claiming that the agency "did not send anyone to the [crash] site."

Indeed, an important part of the Commission's report will remain unknown. Part of the body's conclusions—apparently related to a call for more aggressive covert operations intended to prevent or respond to terrorist acts—was sent to the President in a classified letter. •

short on conclusion. The authors do not purport to know just what happened. They believe that Khalid Jaafar, a young Arab-American from Detroit, "unwittingly" carried the bomb hidden in a bag onto the plane in Frankfurt. Who gave it to him, and why he didn't "examine" the contents, they say, "is the biggest mystery of the Lockerbie investigation."

That, however, is hardly Lockerbie's biggest mystery. For one thing, Frontline reported shortly after the Emerson/Duffy book went to press that all of Jaafar's bags had been accounted for. Whichever bag or suitcase held the bomb, had to disintegrate into fragments, thereby clearing Jaafar's name. His parents believe he became a suspect because he had the only Arabic surname on the flight list.

But the more serious questions raised in the investigation have to do with the nature of the investigation, and why so many relatives and reporters feel a fog of disinformation hangs heavy over the crash.

The Remaining Puzzles

Is the story of Pan Am 103 that some U.S. government, U.N. officials, and foreign leaders were spared because they

had access to information indicating that the flight was threatened, while the traveling public was kept in the dark?

Is it the case that in their rush to make flight schedules and cut costs, Pan Am allowed bags that had not been properly searched to be loaded on its plane?

Is it, as Interfor maintains, that a rogue CIA operation trying to free U.S. hostages by protecting a heroin smuggling ring failed to prevent the bomb from going on board?

Is it, as Frontline suggests, that experienced U.S. intelligence operatives made fatal security mistakes? Is the CIA trying to hide the fact that it could not bring its people home from Beirut safely?

Whatever the answer may be, many relatives of the victims fear they will never know what allowed the bombing to happen or see those responsible punished. An April 1990 letter to George Bush and Margaret Thatcher, cosigned by Paul Hudson and Jim Swire, co-chairs of "U.K. Families-Flight 103," spoke of the "entirely believable published accounts [that]... both of you have decided to deliberately downplay the evidence and string out the investigation until the case can be dismissed as ancient history." •

TIME/OCTOBER 24, 1983

COVER STORIES

Reagan Makes His Moves

It's Clark for Watt, and probably McFarlane for Clark



The decision was so startling that aides warned it could not be kept secret for even a few more hours. If Ronald Reagan did not want the capital to be awash in puzzling leaks and wild rumors, he would have to break the news openly at his very next public appearance. That happened to be a totally incongruous event, a welcoming address to 200 women leaders of Christian evangelical groups visiting Washington. After the usual innocuous pleasantries, the President told the churchwomen that he had reviewed the qualifications of "more than two dozen fine potential nominees" to succeed James G. Watt as Secretary of the Interior and settled on a man whose name was not

on that list: National Security Adviser William Clark.

It was such an unusual switch, from a primary role in foreign affairs to a secondary one in domestic policy, that Washington buzzed for days with speculation about Reagan's and Clark's motives, slighting the more consequential question: Who would replace Clark as the chief White House adviser on foreign and military policy? From the beginning, the obvious candidate was Clark's top deputy, Robert McFarlane, a seasoned and pragmatic professional in national security affairs. But as always when a powerful post is up for grabs, there were other contenders. Officials who feared that "Bud" McFarlane would not be a forceful advocate for hard-line views vig-

orously promoted Jeane Kirkpatrick, Reagan's intellectual, ideological and sometimes abrasive Ambassador to the United Nations.

Pondering the matter over the weekend at Camp David, Reagan reached his decision. He told aides that he planned to appoint McFarlane. But he intended to delay the formal announcement until early this week, giving him time to confer with Kirkpatrick, who is known to be weary with her U.N. job. The President was set to offer her a post in Washington, possibly a newly created one, in which she would have ready access to the Oval Office and the opportunity to advise on a wide range of foreign policy questions.

Such an arrangement would be novel, but nowhere near as intriguing as the

National Security Adviser Clark on the phone after Reagan went public: the Judge was physically and emotionally burned out, and wanted another job



transfer of Clark that prompted it. In the first few hours after that move, even the most savvy officials could not believe their ears. A senior White House staff member who informed colleagues about the change just before Reagan publicly announced it encountered such incredulity that he had to insist, "I'm not joking, it's the truth." Legislative Aide Kenneth Duberstein, phoning Senate Majority Leader Howard Baker with the news, argued for three minutes before he could convince Baker that it was not an elaborate put-on.

The reason for the shock: the National Security Adviser's job is potentially one of the most powerful in the nation and indeed the world. The Interior Secretary's task of managing the Federal Government's vast landholdings, for all the explosive controversy that Watt brought to it, has considerably less than globe-girdling impact; it is of interest primarily to the Western states.

Ordinarily, no Government official moves down to a lesser-ranking post voluntarily. Yet Reagan had given no hint of displeasure with Clark's performance. In fact, Judge Clark had seemed to have pervasive influence over foreign policy. And who other than the President could possibly have enough muscle to push Clark out of a position in which he had been in-

stalled precisely because he was a longtime, trusted intimate of Reagan's from the days when he served as chief of staff to the then Governor of California?

As it turned out, nobody. Nor did Reagan appear to make the switch with an eye to campaign strategy, even though it did serve the purpose of realigning his Administration in the same week that he gave a go-ahead for the formation of a re-election committee, which is tantamount to a declaration of candidacy. For all its potential impact on issues ranging from expansion of national parks to control of nuclear weapons, Clark's transfer was apparently dictated by considerations not of policy or even politics but of personal preference. Clark had been worn down by the strain of his national security position and wanted out, to the point of twice talking about going home to California or at least leaving the White House basement. Reagan wished to accommodate his prized troubleshooter, yet keep him in Government. Interior was the only high-level vacancy.

There is some dispute about just how the idea came up, and the only people who really know are Reagan and Clark. But on one point all accounts agree: Clark was just plain tired. A California rancher, lawyer and judge, Clark came to Wash-

ington originally as No. 2 man at the State Department, with no knowledge of foreign policy. To keep abreast of fast-moving foreign affairs, he had to enter his offices at State and later in the White House before 7 a.m. and plow through papers until late in the evening, six or even seven days a week.

More important, Clark suffered from emotional burnout. He has a considerable talent for bureaucratic infighting; he helped to engineer the resignations of his predecessor as National Security Adviser, Richard Allen, and later of his old boss, Secretary of State Alexander Haig. He sidetracked Haig's unassertive successor, George Shultz, on some issues. Deputy White House Chief of Staff Michael Deaver, another intimate of the President's who had been close to Clark since they were Reagan aides in California, was so put off by Clark's habit of short-circuiting the White House staff system that he and Clark have gone through several periods over the past year when they were barely on speaking terms.

On issues, Clark succeeded in imposing Reagan's visceral hard-line stamp on some policies, notably stern opposition to leftist revolution in Central America. Maladroit in dealing with Congress, Clark led Reagan to a stinging defeat last spring when he counseled the President to

The President breaking his startling news to churchwomen: Interior is not exactly an R-and-R post, but it was the one he needed somebody to fill



CANBERRA TIMES, MONDAY, APRIL 8 1991

No extradition for Hand

Lack of interest in bank director 'astor

By ROD CAMPBELL

It seems almost certain that no-one in Australia will be seeking to have Michael Hand, one-time director of the failed Nugan Hand Bank, extradited from the United States to face criminal charges.

A warrant for Mr Hand's arrest has been in existence for more than 10 years but it is highly unlikely that it will ever be executed.

In fact, the warrant might no longer justify Mr Hand's extradition, given subsequent events.

The warrant alleges that Mr Hand and two other former Nugan Hand employees conspired to pervert the course of justice and breached the companies code. The allegations relate to alleged attempts to thwart a NSW Corporate Affairs Commission investigation of the collapse of the Nugan Hand Bank in early 1980.

Charges against Mr Hand's alleged co-conspirators were dropped several years ago. It might, therefore, be difficult to obtain a conspiracy conviction against one person only (ie, Hand). It might be even harder to use the charge as justification for an expensive extradition application in the US.

The remaining charges were brought under the Companies Code. The five-year limit in which

to begin proceedings has long since expired.

It would appear, therefore, that without fresh charges being prepared, there is no legal basis upon which Mr Hand could be extradited to Australia. It is understood that no such charges exist and that there are no plans to initiate any.

Accordingly, Michael Jon Hand, 49, of Suite 327, 1075 Bellevue Way, NE Bellevue, Washington State, USA, is likely to remain a free man indefinitely.

The Nugan Hand empire collapsed after the death of another director, Frank Nugan. Two coronial inquiries found that Nugan committed suicide, shooting himself as he sat in his Mercedes near Lithgow, NSW. Despite those findings, there are still those who believe he was murdered.

Before his death, Nugan and his brother, Ken Nugan (who died in 1986), had been charged with defrauding their companies. Ken Nugan was jailed later. The allegations undermined confidence in the group and are said to have led to Frank Nugan's suicide.

The bank collapsed, millions of dollars in depositors' funds missing. The extent of the total deficiencies is unknown. They apparently amounted to a few million dollars in the NSW-incorporated companies — "peanuts", as someone close to Nugan Hand investigations said last week.



Michael Hand: likely to remain a free man.

The losses elsewhere, particularly in Hong Kong, where the bank was formally based, were probably much larger. The bank was actually registered in the Cayman Islands.

The total deficiency banded about over the years has ranged from \$7 million to \$24 million.

Mr Hand's present residential address — in Seattle, Washington — has been published recently in the Press but this has not elicited much response from the authorities.

Mr Hand does not appear to be on the active-investigation list of any Australian law-enforcement or regulatory body. The Canberra Times has approached several of these in the past 10 days but has been unable to find one that was particularly interested in locating Mr Hand, let alone seeing him returned to Australia.

Those contacted were the NSW and Victoria Police; the Australian Federal Police; the National Crime Authority; the office of the Federal Director of Public Prosecutions; the Australian Securities Commission; the Australian Taxation Office; and the Attorney General's Department.

Most had no interest in Mr Hand or his whereabouts. The Australian Taxation Office seemed more interested than most.

The NSW Police expressed some interest and suggested that discussions might be held with "corporate affairs" (now the ASC) because that organisation had instituted criminal proceedings in the first place.

That interest seems to have evaporated. The ASC is not interested in Mr Hand, and his name does not appear on its investigation list. It suggested the NSW Fraud Squad, but that is not investigating him either.

The official liquidator of the now-bankrupt Nugan Hand companies, a Sydney chartered account-

Ponsford, master batsman, dies at 90

MELBOURNE: Tributes flowed yesterday for Australian cricket great Bill Ponsford, who died in a country nursing home north of Melbourne yesterday.

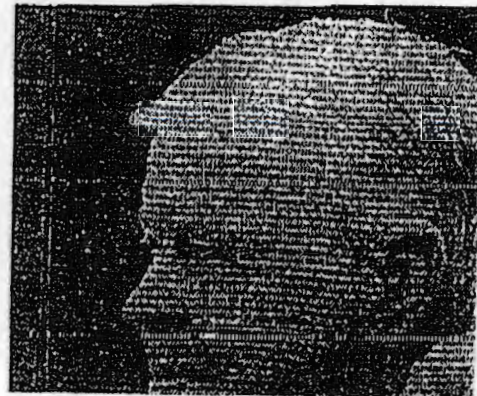
Ponsford, one of the world's most prolific batsmen of the 1920s and 1930s, died peacefully in his sleep, aged 90, a spokeswoman for the nursing home said.

"Ponny" scored seven centuries in a 29-Test career, including a record 451-run partnership with Sir Donald Bradman against England at the Oval in 1934.

ball would land, showed up particularly against spin bowlers.

A former Australian captain and the Melbourne Cricket Club's secretary, Ian Johnson, said Ponsford had been one of the three greatest batsmen the country had produced.

"Had Bradman come 10 years later the great combinations would have been between Ponsford, Bradman and Trumper," Johnson told ABC radio yesterday, but while he was overshadowed by Brad-



observations from these studies and from Torkelson et al. (1958) and Adams et al. (1950) are somewhat inconsistent, thus making conclusions difficult as to the dose levels of 1,1,1-trichloroethane that result in adverse effects. For example, exposure to 650 ppm in the Adams et al. (1950) inhalation study was associated with slight growth retardation in guinea pigs. Further review of this study indicates that 1500 ppm exposure also caused slight growth retardation without causing any organ-specific adverse effects following 1 to 3 months exposure. These observations are in contrast with those of Torkelson et al. (1958), who observed adverse effects in the liver and lungs of guinea pigs exposed to 1000 ppm for 90 days. Results and technical evaluation of recent inhalation studies in mice (Quast et al., 1984) and rats conducted by Dow Chemical when published may be of greater value for the overall RfD consideration for 1,1,1-trichloroethane. [144]

- ORAL RFD CONFIDENCE: Although both the Adams et al. (1950) and Torkelson et al. (1958) studies used both sexes of several species, the number of animals at each dose level was limited, the length of exposure varied with different dose levels and few toxic endpoints were examined. Confidence in these studies is thus considered low. The data base is fairly comprehensive; however, results from these studies are somewhat inconsistent and some of the more recent studies have yet to be critically evaluated. Confidence in the data base is, therefore, rated medium. Confidence in the RfD can be considered medium to low. [144]

ALLOWABLE TOLERANCES

- 1,1,1-Trichloroethane is exempted from the requirement of tolerance for residues when used in the post harvest fumigation of citrus fruit. [40 CFR 180.1012 (7/1/87)]

OSHA STANDARDS

- 8-hour Time-Weighted Average: 350 ppm (1900 mg/cuM) [29 CFR 1910.1000 (7/1/87)]
- Meets criteria for OSHA medical records rule. [29 CFR 1910.20 (7/1/87)]

NIOSH RECOMMENDATIONS

- Occupational exposure shall be controlled so that workers are not exposed to 1,1,1-trichloroethane at greater than a ceiling concentration of 350 ppm (1,910 mg/cuM) as determined by a 15-minute sample. [5]

THRESHOLD LIMIT VALUES

- Time Weighted Average (TWA) 350 ppm, 1910 mg/cuM; Short Term Exposure Limit (STEL) 450 ppm, 2460 mg/cuM (1976) [123]
- BEI (Biological Exposure Index): Methyl chloroform in end-exhaled air prior to the last shift of workweek is 40 ppm. (1989-90 adoption) [123]
- BEI (Biological Exposure Index): Trichloroacetic acid in urine at end of workweek is 10 mg/l. The determinant is nonspecific, since it is observed after exposure to some other chemicals. These nonspecific tests are preferred because they are easy to use and usually offer a better correlation with exposure than specific tests. In such instances, a BEI for a specific, less quantitative biological determinant is recommended as a confirmatory test. The biological determinant is an indicator of

exposure to the chemical, but the quantitative interpretation of the measurements is ambiguous. Their BEIs should be applied cautiously. These biological determinants should be used as confirmatory tests mainly for confirmation of exposures indicated by measurements of a nonspecific determinant or as a screening test if a quantitative test is not practical. (1989-90 adoption) [123]

- BEI (Biological Exposure Index): Total trichloroethanol in urine at end of shift at end of workweek is 30 mg/l. The determinant is nonspecific, since it is observed after exposure to some other chemicals. These nonspecific tests are preferred because they are easy to use and usually offer a better correlation with exposure than specific tests. In such instances, a BEI for a specific, less quantitative biological determinant is recommended as a confirmatory test. The biological determinant is an indicator of exposure to the chemical, but the quantitative interpretation of the measurements is ambiguous. Their BEIs should be applied cautiously. These biological determinants should be used as confirmatory tests mainly for confirmation of exposures indicated by measurements of a nonspecific determinant or as a screening test if a quantitative test is not practical. (1989-90 adoption) [123]
- BEI (Biological Exposure Index): Total trichloroethanol in blood at end of shift at end of workweek is 1 mg/l. The determinant is nonspecific, since it is observed after exposure to some other chemicals. These nonspecific tests are preferred because they are easy to use and usually offer a better correlation with exposure than specific tests. In such instances, a BEI for a specific, less quantitative biological determinant is recommended as a confirmatory test. (1989-90 adoption) [123]

OTHER OCCUPATIONAL PERMISSIBLE LEVELS

- Maximum Allowable Concentration (MAC) USSR 20 mg/cuM [30]

ANIMAL TOXICITY EXCERPTS

- 1,1,1-Trichloroethane tested by drop application to rabbit eyes caused slight conjunctival irritation and no corneal damage. [64]
- Trichloroethane given to dogs in anesthetic doses produces hypotension, with an initial uncompensated vasodilation and later a decreased heart rate, stroke volume, and myocardial contractility, thus accounting for the hemodynamic changes. [35]
- Repeated exposures for 7 hours/day, 5 days/week for 1 to 3 month. At 10,000 ppm, rats develop staggering gait and weakness in 10 min. By 3 hours, irregular respiration and semiconsciousness. [23]
- IV dose of 8.6 mm/kg to dogs was median effective dose for hepatotoxicity as assessed by elevated glutamic-pyruvic transaminase activity, centrilobular necrosis and neutrophilic infiltration in sinusoids and portal areas. Some renal histopathologic changes were also observed. [66]
- Only mild hepatic dysfunction was observed when 1,1,1-trichloroethane was admin IP to mice. [67]
- Rats given 1500 and 750 mg/kg/day orally from 7-117 weeks of age developed nasal discharge, wheezing, urine staining on abdominal fur, and hunched appearance. Tumors observed were not attributed to 1,1,1-trichloroethane. [68]

- Groups of 50 male and 50 female Osborne-Mendel rats, 7 weeks of age, received technical-grade 1,1,1-trichloroethane containing 3% para-dioxane and 2% minor impurities in corn oil by gavage on 5 days a week for 78 weeks at 2 dose levels: 750 mg/kg body wt/day and 1500 mg/kg body wt/day. A group of 20 male and 20 female untreated rats served as matched controls. The animals were killed 110 weeks after the start of treatment. Both males and females given the test chemical exhibited early mortality when compared with the untreated controls; only 3% of treated rats survived to termination of experiment. A few tumors not considered to be related to treatment were observed. [4]
- Groups of 50 male and 50 female B6C3F1 mice, 5 weeks of age, were given technical-grade 1,1,1-trichloroethane containing about 3% para-dioxane and 2% minor impurities in corn oil by gavage on 5 days/week for 78 weeks. Initially the high and low doses for both male and female mice were 4000 and 2000 mg/kg body wt/day; during the 10th week, these doses were increased to 5000 and 2500 mg/kg body wt/week; at week 20 they were increased to 6000 and 3000 mg/kg body wt/day and maintained at these levels to the end of the study. Time-weighted Average doses for high- and low-dose mice were 5615 and 2807 mg/kg body wt/day, respectively. A group of 20 male and 20 female untreated mice were used as controls; no vehicle-control animals were used. In males, 10/20 of the unmatched controls, 21/50 of the low-dose group, and 25/50 of the high-dose group had died within 1 Year after the start of the experiment; in females, the corresponding figures were 1/20, 9/50 and 20/50. At 90 weeks, 15 low-dose males, 11 high-dose males, 23 low-dose females and 13 high-dose females were still alive. All animals were killed at 95 weeks. Almost all organs, and tissues with macroscopically visible lesions, were examined histologically. Three out of 49 males in high-dose group developed liver-cell adenomas and 1 a hepatocellular carcinomas. No liver tumors occurred in controls (NCI, 1977). [4]
- Acute exposure of anesthetized dogs to TCE resulted in dose-dependent, biphasic decline in arterial pressure and cardiovascular depression. [69]
- Rabbits were exposed to methyl chloroform to study the effects on the central nervous system. To achieve a steady concentration the solvent was infused as a lipid emulsion. At blood levels of methylchloroform above 75 ppm a so called positional nystagmus, indicating central vestibulo-oculomotor disturbances was observed. [70]
- Rats, guinea pigs, squirrel monkeys, rabbits and dogs were continuously exposed by inhalation for 90 days to 135 ppm or 370 ppm or to 2200 ppm for 8 hours, 5 days/week for 6 weeks. Over a period of almost 4 years, no symptoms of toxicity were seen in any species and 1,1,1-trichloroethane did not significantly affect blood serum urea nitrogen levels. [71]
- 1,1,1-Tetrachloroethane showed mutagenic activities when tested by salmonella/microsome test, the basic test on drosophila, and the micronucleus test on mouse bone marrow. [72]
- 1,1,1-Trichloroethane was applied to skin of guinea pigs for histopathological studies. Biopsies taken at different times of exposure showed the presence of karyopyknosis, karyolysis, and spongiosis. It also produced junctional separation and pseudoeosinophilic infiltration. [73]
- Intermittent inhalation exposure for 5 days, for 6 hours/day to 1,1,1-trichloroethane or in combination with trichloroethylene caused no observable behavioral effects in adult rats. [39]

- A multigeneration reproduction study was modified to incl screening for dominant lethal and teratogenic effects of 1,1,1-trichloroethane in drinking water solution. Male and female icr swiss mice received 1,1,1-trichloroethane at concentration of 0, 0.58, 1.75, or 5.83 mg/ml. These concentration were designed to yield daily doses of 0, 100, 300, or 1,000 mg/kg. No taste aversion was evident and there appeared to be no dose-dependent effects on fertility, gestation, viability or lactation indices. Pup survival and wt gain were not adversely affected. 1,1,1-Trichloroethane failed to produce significant dominant lethal mutations or teratogenic effects in either of the 2 generations tested. [74]
- Pregnant mice and rats were exposed to concentration of 875 ppm. Both were exposed for 7 hours daily periods on days 6 through 15 of gestation. No fetal toxicity or teratogenicity was found. [75]
- CF-1 mice were continuously exposed to 0, 250 or 1,000 ppm by inhalation for up to 14 weeks. At 1,000 ppm, moderate liver damage was indicated by elevated triglycerides, cytoplasmic alterations, and necrosis of hepatocytes. [76]
- Experimental animal data indicate that the toxicity from an acute exposure to 1,1,2-isomer is several times that of the 1,1,1-isomer. [30]
- Methyl chloroform injected into air space at 2, 3, and 6 days of incubation at 50 or 100 mg/egg. Malformations observed included absence of eyes, beak deformations, exoencephaly, brain hemorrhages, anemia, edema, and musculo-skeletal defects of lower extremities of chick embryos. [77]
- Cell transformation tests using Fischer 344 rat embryo cultures exposed to 9.9×10^{-1} or 9.9×10^{-2} μ M for 48 hours were positive. Cells from foci of cultures treated with lower dose when injected sc into 8 newborn Fischer 344 rats produced local fibrosarcomas in 100%. Cells from control (acetone-treated) cultures did not induce fibrosarcomas. [78]
- Study of male and female rats exposed by inhalation 6 hours/day, 5 days/week for 52 week to 875 ppm or 1750 ppm. No statistically significant increased incidence of tumors was observed. [79]
- Moderately pronounced venous hyperemia of the lungs, emphysematous enlargement of individual groups of alveoli, and swelling of the bronchial epithelium was found in 5 rats exposed 4 hours/day, for 50 days at 73 ppm. After 120 days of exposure, the emphysematous condition was much more pronounced. Intraalveolar walls were thin and some had broken down. Vascular walls were thickened and swollen, and around many of them were accumulations of lymphoid and histiocyte cell elements and isolated plasma cells. The mucous membrane of the bronchii was swollen, and small amount of mucous and detached epithelial cells were observed in the lumen. Hyperplastic peribronchial lymphatic lymph nodules were found. [80]
- Sprague-Dawley rats exposed by inhalation to 4345 mg/cuM (800 ppm) 1,1,1-trichloroethane for 4 weeks had increase liver wt. 1,1,1-Trichloroethane was mutagenic in the Ames Salmonella assay in strains TA1535 and TA100 when tested at Concentration of 0.1, 0.5, and 1.0 ml volume in an open glass dish inside desiccators. [36]

ANIMAL TOXICITY VALUES

- LC50 Rat inhalation 24,000 ppm/1 hour; 18,000 ppm/3 hours; 14,000 ppm/7 hours [29]
- LC50 Mouse inhalation 13,500 ppm/10 hours [29]
- LD50 Mouse (female) single oral 11.24 g/kg [29]
- LD50 Rabbit (female) single oral 5.66 g/kg [29]
- LD50 Guinea pig (male) single oral 9.47 g/kg [29]
- LD50 Mouse IP 5080 mg/kg (95% confidence limits 4,410 to 6,010 mg/kg) [60]

ECOTOXICITY VALUES

- LC50 Pimephales promelas (fathead minnow) 52.8 mg/l/96 hours (flow through test) [29]
- LC50 Pimephales promelas (fathead minnow) 105 mg/l/96 hours (static test) [29]
- LC50 Poecilia reticulata (guppy) 133 ppm/7 day (Conditions of bioassay not specified) [29]

CURRENT REPORTS

IARC SUMMARY AND EVALUATION

- No data are available in humans. Inadequate evidence of carcinogenicity in animals. OVERALL EVALUATION: Group 3: The agent is not classifiable as to its carcinogenicity to humans. [53]

EPA SUMMARY AND EVALUATION

- D; not classifiable as to human carcinogenicity. There are no reported human data and animal studies (one lifetime gavage, one intermediate-term inhalation) have not demonstrated carcinogenicity. Technical grade 1,1,1-trichloroethane has been shown to be weakly mutagenic, although the contaminant, 1,4-dioxane, a known animal carcinogen, may be responsible for this response. [144]

TSCA TEST SUBMISSIONS

- The ability of 1,1,1-trichloroethane to induce DNA repair in the hepatocyte primary culture (HPC) system was evaluated using hepatocytes from male B6C3F1 mice and osborne-mendel rats. In the mouse HPC/DNA repair assay, 1,1,1-trichloroethane was genotoxic from .001% to .00001%. 1,1,1-trichloroethane was minimally toxic to the cultures at .01%, .1% and 1%. in the rat HPC/DNA repair assays, 1,1,1-trichloroethane was not genotoxic at 1% concentration, or at lower concentrations assayed. The positive and negative controls in both mouse and rat assays gave the expected values. [81]

- 1,1,1-Trichloroethane was examined for its affect on cell transformation using the BALB/C-3T3 neoplastic transformation assay, performed in glass incubation chambers in the absence of an exogenous metabolic activation system, at nominal concentrations of 4, 20, 100 and 250 ug/ml. A clear dose-dependent positive response was induced by 1,1,1-trichloroethane in the transformation assay at the 20, 100 and 250 ug/ml concentration levels. No significant response occurred at the 4 ug/ml level. [82]
- Chronic inhalation toxicity and oncogenicity were evaluated in groups of male and female B6C3F1 mice (80/sex/group) receiving whole body exposure to 1,1,1-trichloroethane in an inhalation chamber at nominal concentrations of 0, 150, 500 or 1500 ppm for 6 hours/day, 5 days/week for 2 years. There were no statistically significant differences in survivability of any exposed groups of mice when compared to their respective controls. In male mice exposed to 500 ppm there was a statistically significant incidence of cystitis and dilatation of the renal pelvis, and inflammatory and obstructive processes involving the genitourinary tract. No tumors in female mice were identified as being statistically significantly increased. A statistically significant decrease in the total number of benign tumors in the 1500 ppm male mice group was observed. Parameters of hematology, clinical chemistry, final body weights, and absolute organ weights for male and female mice were unaffected by the treatment. [83]
- Subchronic inhalation toxicity was evaluated in three groups of male rats (Sherman strain), 30 rats/group exposed to 1,1,1-trichloroethane aerosols and 1,1,1-trichloroethane plus fluorocarbon 310 resins at nominal concentrations of 0.6 mg/l (100 ppm) to 6.6 mg/l (1200 ppm), for 6 hours/day, 5 days/week for 3 months. Animals exposed to 1,1,1-trichloroethane alone exhibited no adverse effects with respect to growth, hematologic and clinical parameters, and no deaths occurred among animals exposed successively to increasing concentrations. Parameters significantly affected by exposure to 1,1,1-trichloroethane plus fluorocarbon 310 included; spleen to body weight ratio (significantly lower), acute pulmonary edema, congestion and hemorrhage. A total of 21 animals (70%) died from exposure to 1,1,1-trichloroethane plus fluorocarbon 310 resins. [84]
- A percutaneous absorption study was conducted with adult male albino rabbits receiving 1,1,1-trichloroethane at 0, 15, 50, 100, 200 and 500 mg/kg daily. At each dose level, 4 rabbits (2 with intact skin, 2 with abraded skin) were treated 8 hours/day, 5 days/week, for 90 days. The treatment produced no signs of toxicity as indicated by hematology parameters, weight gain, general appearance, food consumption and pathology when compared with both positive (isopropyl alcohol) and untreated controls. [85]
- Chronic toxicity and oncogenicity were evaluated in groups of male and female Fischer 344 rats (80/sex/group) exposed to chloroethene (1,1,1-trichloroethane) by inhalation at 0, 150, 500, or 1500 ppm for 6 hours/day, 5 days/week for 2 years. The body weights of female animals were significantly decreased compared to controls at various times throughout the study, whereas relative and absolute organ weights were unaffected. The hematology, urinalysis, and clinical chemistry values were unaffected by the treatments. Necropsy of animals sacrificed at 6, 12 and 18 months of exposure revealed no significant exposure-related effects and there were no significant differences in the incidence of tumor-like lesions in the control or exposed rats. Microscopic examination of the livers of animals exposed to 1500 ppm revealed an

exposure-related accentuation of the normal hepatic lobular pattern consisting of altered cytoplasmic staining in the cells surrounding the central vein. [86]

- Teratogenicity and neurotoxicity were evaluated in female Long-Evans rats (30/group) exposed via inhalation to a nominal concentration of 0 or 2100 ppm methyl chloroform (MC) in one of three exposure regimens: MC exposure before mating and during pregnancy, MC exposure only before mating, or MC exposure only during pregnancy. Pre-mating exposure was conducted for 6 hours/day, 5 days/week for 2 weeks, with mating starting day 15 and the pre-mating exposure regimen continued until pregnancy was confirmed. Pregnancy exposure was conducted for 6 hours/day, 7 days/week through day 20 of pregnancy. One-half of the dams in each group were sacrificed on day 21 of pregnancy. No significant differences were observed in measurements of maternal toxicity or embryo toxicity except for a decrease in the fetal body weight in dams exposed during pregnancy and a significantly increased incidence of skeletal and soft tissue variations in fetuses from dams exposed both before mating and during pregnancy (these variations in fetal morphology were reported to be indicative of developmental delay rather than true malformation). No significant treatment effects were observed in surviving offspring with regard to body weights, survival indices, gross lesions observed during autopsy at 12 months of age, and neurobehavioral tests of open field activity, running wheel activity, and amphetamine challenge tests. [87]
- 1,1,1-Trichloroethane was examined for mutagenic activity in Salmonella typhimurium tester strains TA98, TA100, TA1537 and TA1538, both with and without addition of rat liver S9 fraction to provide metabolic activation (Ames Test). Using the plate incorporation technique (dose not stated), all assays were negative. [88]
- The mutagenicity of 1,1,1-trichloroethane (TCE) was evaluated in Salmonella tester strains TA100 and TA1538 (Ames Test, desiccator assay variation), both in the presence and absence of added metabolic activation by Aroclor-induced rat liver S9 fraction. Based on the results of preliminary bacterial toxicity determinations, TCE was tested for mutagenicity at dose levels of 0, 0.1, 0.5 and 1.0 ml/desiccator. TCE caused a positive response in strain TA1535 with metabolic activation at 1.0 ml/desiccator. [89]
- The mutagenicity of 1,1,1-trichloroethane (TCE) was evaluated in Salmonella tester strain TA100 (Ames Test, desiccator assay variation), both in the presence and absence of added metabolic activation by Aroclor-induced rat liver S9 fraction. TCE was tested for mutagenicity at dose levels of 0.4, 1.90 and 8.92 gm/desiccator. No rationale for selection of dose levels used was reported. TCE caused a positive response in strain TA100 with metabolic activation at 1.90 ml/desiccator. [90]
- The fate of methyl chloroform (MC) was evaluated in male Fisher 344 rats (4/group) and male B6C3F1 mice (4/group) receiving whole body exposures of MC at nominal concentrations of 0 or 1500ppm in a dynamic air flow chamber for 6 hours/day, 5 days/week for 16 months. On the last day of exposure, all animals (including the 0ppm group) received a single six hour exposure of 14C-MC. The routes of excretion and tissue concentration of 14C-MC was similar between control (0ppm) and repeatedly treated rats and mice (1500ppm). The major route of elimination of MC was exhalation of the parent chemical which constituted approximately 97% of the total radioactivity in rats and 92-94% in mice. The remaining radioactivity was recovered as metabolites of

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MC in expired air and nonvolatile radioactivity in the urine, feces, carcass and cage wash. On a body weight basis, mice were observed to eliminated MC more rapidly via the pulmonary route and to biotransformation approximately 5-fold more MC relative to rats. [91]

- The fate of 1,1,1-trichloroethane was evaluated in albino New Zealand rabbits (9/group) receiving whole body exposure of test material at a concentration between 232-362ppm (target concentration; not reported) in a dynamic air flow chamber for 72 hours. Three animals per group were sacrificed at the end of the exposure period and at 24 and 48 hours post-exposure. There was no effect of treatment in animals as indicated by body weights, blood tests and bone marrow counts. Fat tissue analysis for 1,1,1-trichloroethane indicated a concentration range of 316-374ppm, 0-75ppm and none detected at the end of exposure, and 24 and 48 hour post exposure, respectively. [92]
- The fate of methyl chloroform (MC) was evaluated in six healthy male Caucasian volunteers (26 to 54 years old) receiving a single six hour exposures to the test material at 350 and 35ppm in a dynamic air flow chamber. The concentration of MC in blood and expired air were proportional to the exposure concentration and indicated about 25% of the inhaled MC was absorbed. Elimination of MC was tri-exponential with half-lives estimated as 44 minutes, 5.7 hours and 53 hours for the initial, intermediated and terminal phases. Over 91% of the absorbed MC was eliminated as the parent chemical via the lungs, 5-6% was eliminated as the metabolites trichloroethanol and trichloroacetic acid, and less than 1% remained in the body after 9 days. It was concluded that elimination of MC was first order. [93]
- The fate of 1,1,1-trichloroethane (TCE) was evaluated in three experiments. The first experiment employed a male 9 week old white rat weighing 183 grams receiving an single intraperitoneal injection of radiolabeled material at 109.2mg. In the second and third experiment, the same procedures as experiment one were followed, but with a nine week old male rat weighing 170 grams receiving 109.2 mg and an 11 week old female weighing 183 grams receiving 129.6 mg, respectively. About 98% of the radioactivity was expired via the lungs. About 0.5% of the injected dose was expired as liberated 14-CO₂. After 24 hours, the amount of radioactivity in the rat was negligible. The urine contain one of more radioactive compounds, and analysis suggested the presence of monochloro- and dichloroacetic acids. The amount of radioactivity in the urine was about 0.5% of the injected dose. [94]

VII ENVIRONMENTAL FATE AND EXPOSURE EXCERPTS

ENVIRONMENTAL FATE AND EXPOSURE SUMMARY

- 1,1,1-Trichloroethane is likely to enter the environment from air emissions or in wastewater from its production or use in vapor degreasing, metal cleaning, etc. Releases to surface water will decrease in Concentration almost entirely due to evaporation. Spills on land will decrease in concentration almost entirely due to volatilization and leaching. Releases to air will be transported long distances and partially return to earth in rain. In the troposphere, 1,1,1-trichloroethane will degrade very slowly by photooxidation and also slowly diffuse to the stratosphere where photodegradation will be rapid. Major human exposure is from air and drinking water. Exposure can be high near sources of emission or where drinking water is contaminated. [2]

POLLUTION SOURCES

NATURALLY OCCURRING SOURCES

- 1,1,1-Trichloroethane is not known to occur as a natural product. [95]

ARTIFICIAL SOURCES

- Wastewater and stack and fugitive emissions from production; Volatilization losses from its use in the cold cleaning of metals, vapor degreasing and as a solvent and aerosol, etc(1). Mean emissions rate of 1,1,1-trichloroethane that would contribute to its presence in indoor air are (source - rate ng/min-sq m): cleaning agents and pesticides - 37,000; painted sheetrock - 31; glued wallpaper - 84; glued carpet 260(2). [96]

ENVIRONMENTAL FATE

- TERRESTRIAL FATE: 1,1,1-Trichloroethane evaporates fairly rapidly into the atmosphere because of its high vapor pressure. Because 1,1,1-trichloroethane does not adsorb strongly to soil, it should leach extensively. [2]
- AQUATIC FATE: Primary loss will be by evaporation into the atmosphere. Half-life will range from hours to a few weeks depending on wind and mixing conditions. Half-lives in a mesocosm simulating the conditions in Narragansett Bay were 24, 12, and 11 days under spring, summer and winter conditions, respectively(1). Biodegradation and adsorption onto particulate matter will be insignificant relative to volatilization (1). Turbulence in microcosm tanks are substantially less than in the bay or the open ocean so volatilization may be significantly (up to an order of magnitude) faster in the bay or open water than measured in the mesocosms. [97]

- **ATMOSPHERIC FATE** - 1,1,1-trichloroethane is fairly stable in the atmosphere and is transported long distances, being found even at the South Pole (1,2,3). It is transported to Barrows, Alaska from the mid-latitudes(1). It is slowly degraded principally by reaction with hydroxyl radicals and has a half-life of 6 months to 25 years (2,4). The rate of degradation is increased by the presence of chlorine radicals and nitrogen oxides. 15% of the 1,1,1-trichloroethane drifts into the stratosphere where it is rapidly degraded by photodissociation (2,4). Due to the large input of 1,1,1-trichloroethane into the atmosphere and its slow degradation, the amount of 1,1,1-trichloroethane in the atmosphere is increasing by 12-17% a year (6,4). Some of the 1,1,1-trichloroethane returns to earth in rain as is evidenced by its presence in rainwater and a 40% reduction in air concentrations on rainy days(5). [98]
- The codisposal of selected organic priority pollutants with municipal refuse was investigated with four pilot scale simulated landfill cells operated under the influence of single pass leaching or leachate recycle. The acid formation and methane fermentation phases of landfill stabilization were established and described in terms of routine analyses performed on leachate and gas samples for a variety of indicator parameters. During a 15 month period, little evidence of release of trichloroethane was obtained even after elution of as much as 20 bed volumes in the recycle cells. Moreover, patterns of microbially mediated conversion of substrate were not influenced by the presence of the organic priority pollutants and could be accelerated through leachate recycle. Assimilation of the organic priority pollutants throughout the phase of landfill stabilization was ascribed to physical-chemical and biochemical attenuation and possible fractionation within the waste mass. [99]

ENVIRONMENTAL TRANSPORT

BIOCONCENTRATION

- The Bioconcentration Factor (BCF) in bluegill sunfish in a 28 day test was 8.9(2). This indicates that 1,1,1-trichloroethane has little tendency to bioconcentrate in fish. Although the amount of experimental data for 1,1,1-trichloroethane is limited, confidence in this result is increased because values of BCFs in related compounds are similar(1). [102]

SOIL ADSORPTION AND MOBILITY

- The adsorption of 1,1,1-trichloroethane to soil is proportional to the organic carbon content of the soil(4-6). The mineral content of the soil is not a contributing factor(5). The partition coefficient of 1,1,1-trichloroethane to 5 soils (organic carbon 0.1-4.9%) ranged from less than 0.05 to 0.5 l/g while that adsorbed to sand and clay was too small to determine the isotherms(6). The partition coefficient of 6 chlorinated alkanes including 1,1,1-trichloroethane between bentonite and spring water ranged from 27-76 and between Neckar River sediment and water, 2-108(7). 1,1,1-Trichloroethane is adsorbed strongly to peat moss, less strongly to clay, very slightly to dolomite limestone and not at all to sand (2). It has a low adsorption to silt loam (KOC = 183)

(3). From the fact that it is not retained in the soil during bank infiltration, and that it is frequently found in groundwater in high concentrations, one can safely conclude that it is not adsorbed strongly by soils, especially subsurface soils (1). [120]

VOLATILIZATION FROM WATER AND/OR SOIL

- 1,1,1-Trichloroethane has a high Henry's Law constant (8×10^{-3} atm-cuM/mole(4)) and will volatilize rapidly from water and soil with diffusion through the liquid phase controlling volatilization from water(1,4). Half-life for evaporation from water obtained from laboratory systems range from a fraction of an hour to several hours(2). Using the Henry's Law constant, one would calculate a half-life of 3.7 hours from a model river 1 m deep with a 1 m/sec current and a 3 m/sec wind(4). Using the experimentally determined ratio of the volatilization rate constants of 1,1,1-trichloroethane relative to oxygen, 0.59(5), and the oxygen reaeration coefficients for various bodies of water, one calculates that the volatilization half-lives range from 5.1-10.6 days for ponds, 3-29 hours for rivers, and 3.8-12 days for lakes(4, SRC). Loss in a mesocosm is entirely due to evaporation and half-lives ranged from 24 days in spring to 11 days in winter(3). [121]

ENVIRONMENTAL CONCENTRATIONS

OTHER ENVIRONMENTAL CONCENTRATIONS

- Of the 1026 brand samples of household products representing 67 products categories (cleaners, polishes, lubricants, and paint removers), 14.1% of samples and 47.8% of product categories contained 1,1,1-trichloroethane ranging from 3.3 to 100%. [103]

WATER CONCENTRATIONS

- DRINKING WATER - 133 United States cities with Finished surface water - 0.4 ppb median, 3.3 ppb maximum; 23 United States cities with finished groundwater - 2.1 ppb median, 3.0 maximum, 22% of the samples were positive(1). Contaminated drinking water wells in New York, New Jersey, Connecticut and Maine have values of 950-5440 ppb(2). Results of the 1982 EPA Ground Water Supply Survey for 1,1,1-trichloroethane (466 samples) - 5.8% pos, 0.8 ppb median of positives, 18 ppb maximum(4). As part of EPA's Total Exposure Assessment Methodology (TEAM) study, the concentration of various toxic substances in drinking water of sample populations was measured(3). The mean (maximum) concentrations of 1,1,1-trichloroethane in Bayonne and Elizabeth, New Jersey, an industrial/chemical manufacturing area, was 0.6 (5.3), 0.2 (2.6), and 0.2 (1.6) ppb in the fall 1981, summer 1982, and winter 1983, respectively(3). For comparison the drinking water of a sample of residents of a manufacturing city without a chemical or petroleum refining industry, Greensboro, NC and a small, rural, and agricultural town in North Dakota contained 0.03 (0.05) and 0.04 (0.07) ppb of 1,1,1-trichloroethane, respectively(3). [104]
- GROUNDWATER - Raw groundwater in 13 United States cities - 1.1 ppb median, 13 ppb maximum, 23% were positive. [105]

- SURFACE WATER - Raw surface water in 105 United States cities - 0.2 ppb median, 1.2 ppb maximum, 12% positive(1). Large study of the Ohio R. Basin in 1980-1981 (4972 samples) reports 33.6% of samples above 0.1 ppb, 3.9% between 1.0 and 0.3% above 10 ppb(2). In a study of 14 heavily industrialized river basins in 1975-1976, 9% of the sites had values above 1 ppb, and 8 ppb was the maximum value measured(3). At industrial sites, mean values are above 10 ppb with maximum values as high as 334 ppb(4). Concentration 20-800 meters away from outfalls of four producing plants and 1 user was 0.1-169 ppm(5). [106]
- SEAWATER: Liverpool Bay seawater averaged less than 0.25 ppb, 3.3 ppb maximum. [107]
- RAIN/SNOW - West Los Angeles 26 Mar 82 - 69 parts per trillion(2); La Jolla, Ca - 8.1 parts per trillion (3); an industrial area of England - 0.9 parts per trillion(1). Southern California 6.2 parts per trillion, central California - 0.6 ppt, Alaska 27 ppt(1). [108]

EFFLUENTS CONCENTRATIONS

- Mean values in raw wastewater of 15 industries range from 3.6 to 38,000 ug/l with the maximum value range from 10 to 1,300,000 ug/l. The highest values were for the metal finishing industry(1). Mean value of treated wastewater for 11 industries 0.6-89 ug/l with maximum values ranging from 0.6 to 7100 ug/l (1). 18-344 ppb outfall from producing plants (2). [109]
- In a comprehensive survey of wastewater from 4000 industrial and publicly owned treatment works (POTWs) sponsored by the Effluent Guidelines Division of the USEPA, 1,1,1-trichloroethane was identified in discharges of the following industrial category (frequency of occurrence, median concentration in ppb): timber products (2; 359.7), leather tanning (4; 2.7), iron and steel manufacturing (6; 34.4), petroleum refining (5; 13.4), nonferrous metals (12; 35.9), paint and ink (36; 9.7), printing and publishing (6; 28.3), ore mining (5; 2.3), coal mining (6; 5.7), organics and plastics (23; 8.5), inorganic chemicals (13; 5.2), textile mills (12; 6.0), plastics and synthetics (12; 1.6), pulp and paper (12; 7.0), rubber processing (10; 24.0), soaps and detergents (1; 26.3), auto and other laundries (10; 6.4), pesticides manufacture (4; 17.0), photographic industries (3; 3.9), pharmaceuticals (20; 3.9), explosives (7; 14.6), plastics manufacturing (1; 8.3), foundries (5; 54.0), electronics (36; 62.5), electroplating (2; 229.1), organic chemicals (15; 7.2), mechanical products (20; 98.0), transportation equipment (5; 706.3), amusements and athletic goods (4; 33.0), synfuels (8; 6.63), publicly owned treatment works (302; 10.6)(1). The highest effluent concns were 6397 and 6028 ppb in the mechanical products and electronics industry, respectively. [110]

SEDIMENT AND/OR SOIL CONCENTRATIONS

- Liverpool Bay marine sediment less than 5.5 ppb (1). Soil around production plants and user industry 0.06-0.94 ppb; sediment upstream and downstream of production plants and user industry 0.039-2.6 ppb; Average background concentration in soil (St. Francis National Forest) 0.42 ppb; Average background concentration in sediment (St. Francis National Forest) 0.45 ppb (2). [111]

ATMOSPHERIC CONCENTRATIONS

- RURAL/REMOTE: Rural/remote sites in US (1977-1980) - 60-156 part/trillion, 110 part/trillion Average(1-3). Yearly rate of increase is 12-17%/year(1,2). The baseline 1,1,1-trichloroethane level in the northern hemisphere (60 Deg N to 40 Deg N) is 200 part/trillion while in the northern hemisphere it is 140 part/trillion(10). URBAN/SUBURBAN: Urban/suburban in US areas (1977-1980) - 420 part/trillion average, 700-8000 part/trillion maximum, less than 20% samples may be positive(3-6). SOURCE AREAS: Source dominated areas in US (1977-1980) - 1200 part/trillion average(3). Although maximum values are usually under 10 ppb, one maximum value of 111 ppb has been reported in New Jersey(7). INDOOR AIR: The concentration of 1,1,1-trichloroethane in a new office building before and after occupancy was 500 and 60 ug/cuM (90 and 10.8 ppb), respectively(9). OTHER: As part of EPA's Total Exposure Assessment Methodology (TEAM) study, the concentration of various toxic substances in the personal air (2 consecutive 12-hours periods) of sample populations was measured as well as the outdoor air near their residences(8). The weighted median results for 1,1,1-trichloroethane in personal air in Bayonne and Elizabeth, New Jersey, an industrial/chemical manufacturing area, was 17, 9.3, and 22 ug/cuM in the fall 1981, summer 1982, and winter 1983, respectively(8). The corresponding results for outdoor air was 4.6, 5.1, and 1.4 ug/cuM(8). For comparison the personal air of a sample of residents of a manufacturing city without a chemical or petroleum refining industry, Greensboro, NC and a small, rural, and agricultural town in North Dakota contained 32 and 25 ug/cuM of 1,1,1-trichloroethane, respectively and the outdoor air 60 and 0.05 ug/cuM(8). [112]

FOOD SURVEY VALUES

- 5-10 ng/g oils and fats; 1-4 ng/g fruits and vegetables; 2-7 ng/g meat, tea, bread (1). 1,1,1-Trichloroethane was not found in samples of wheat, corn, oats, corn meal or corn grits(2). Of the 9 samples of intermediate grain-based food analyzed, it was found in 3, namely, yellow corn meal (3.8 ppb), fudge brownie mix (3.0 ppb), and yellow cake mix (0.74 ppb)(1). [113]

PLANT CONCENTRATIONS

- Less than 9.4-35 ppb (in analytical work CCl₄ was not separable from 1,1,1-trichloroethane) in marine algae. [107]

FISH AND/OR SEAFOOD CONCENTRATIONS

- Three species of fish, mollusks in Irish Sea - 2-16 ppb(1). Flesh of nine samples of various fish from Liverpool Bay and Thames Estuary - 0-5 ppb, gut contained up to 26 ppb (2). Marine invertebrates in bays and estuaries of Great Britain - 0-34 ppb (2). [114]

ANIMAL CONCENTRATIONS

- Irish Sea and North Sea - fresh and saltwater birds - 2.4 to 26 ppb, grey seal - 2.5 to 7.2 ppb. Frodsham Marsh, England - shrew -2.6 to 7.8 ppb. [115]
- Less than 16-30 ppb grey seal blubber, less than 2.3-7 ppb common shrew, less than 1.1-4.7 ppb in flesh or organs of fresh- and seawater birds (in analytical work CCl₄ was not separable from 1,1,1-trichloroethane). [107]

MILK CONCENTRATIONS

- Detected in all eight samples of mother's milk from four urban areas. [116]


ENVIRONMENTAL TRANSFORMATIONS

BIODEGRADATION


- No, or very slow degradation in soils. No degradation has been observed in subsurface soils in 27 weeks; However in loamy sand, slow degradation has been observed under acclimated conditions (1,2). Slow degradation may occur in water under anaerobic or aerated conditions; Degradation may take several weeks and acclimation is important (3,4). In seawater, a half-life of 9 months has been determined and vinylidene chloride is the degradation product(5). No degradation in river water has been found(6). No utilization of 1,1,1-trichloroethane occurred in a continuously-fed aerobic biofilm reactor that utilized acetate as its primary substrate(8). However, 98% removal was obtained in a similar anaerobic reactor with a 2 day retention time after 8 weeks acclimation(8). 1,1,1-Trichloroethane degraded to vinylidene chloride as a first step in its biotransformation in microcosms containing aquifer water and sediment collected from uncontaminated sites in the Everglades(7). Considerable degradation occurred within two weeks(7). Field evidence of biodegradation in aquifers was obtained by following the concentration of 1,1,1-trichloroethane in a confined aquifer after it was injected with reclaimed groundwater(8). The half-life of 1,1,1-trichloroethane was 231 days with biodegradation given as the probable cause of loss(8). [100]

ABIOTIC DEGRADATION

- Hydrolysis is not a significant degradation process having a half-life of approximately 6 months (1,2). The product of hydrolysis is vinylidene chloride(11). Direct photolysis is not important in the troposphere since 1,1,1-trichloroethane does not absorb light above 290 nm. In the stratosphere, photolysis is important and leads to the chemical's rapid degradation (2,3). 1,1,1-Trichloroethane reacts slowly with hydroxyl radicals which are produced by sunlight in the atmosphere. The half-life for this reaction is 5 Years, assuming a diurnally averaged OH radical concentration of 5×10^{-5} radicals/cu cm(12). Estimates of half-life in the troposphere range from 0.5 to 2.2 years, much slower than unsaturated chloroalkanes, but much greater than completely chlorinated compounds such as carbon tetrachloride(1,4,5). Products of



photooxidation include phosgene, Cl_2 , HCl , and CO_2 (6,7). Degradation is reported to be greatly increased by exposure to ozone and chlorine but no actual data could be found in regard to 1,1,1-trichloroethane's reactivity with ozone(7). On exposure to nitrogen oxide, less than 5% degradation occurs in 8 hours (8). There is some evidence that photodegradation is catalyzed by surfaces which results in complete degradation within 2 weeks (9). Indirect evidence of photodegradation comes from the fact that levels of 1,1,1-trichloroethane are lowest in the afternoon and 8% less on sunny days than cloudy ones (10). Photodegradation is not observed in water(2). [101]



VIII REGULATIONS AND COMPLIANCE STANDARDS

WATER STANDARDS

- Toxic pollutant designated pursuant to section 307(a)(1) of the Clean Water Act and is subject to effluent limitations. [40 CFR 401.15 (7/1/87)]

ATMOSPHERIC STANDARDS

- This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). These standards implement Section 111 of the Clean Air Act and are based on the Administrator's determination that emissions from the SOCMI cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. 1,1,1-Trichloroethane is produced, as an intermediate or final product, by process units covered under this subpart. These standards of performance become effective upon promulgation but apply to affected facilities for which construction or modification commenced after January 5, 1981. [40 CFR 60.489 (7/1/87)]
- 1,1,1-Trichloroethane, pursuant to section 112 of the Act, has been designated as a hazardous air pollutant. [40 CFR 61.01 (7/1/87)]

CERCLA REPORTABLE QUANTITIES

- Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 1,000 lb or 454 kg. The toll free telephone number of the NRC is (800) 424-8802; in the Washington metropolitan area (202) 426-2675. The rule for determining when notification is required is stated in 40 CFR 302.6 (see section IV. D.3.b). [50 FR 13456 (4/14/85)]

TSCA REQUIREMENTS

- Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule (40 CFR Part 716). The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. 1,1,1-Trichloroethane is included on this list. [40 CFR 716.120 (7/1/87)]
- Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, use, and exposure to EPA. [40 CFR 712.30 (7/1/87)]

FDA REQUIREMENTS

- 1,1,1-Trichloroethane is an indirect food additive for use only as a component of adhesives. [21 CFR 175.105 (4/1/86)]

RCRA REQUIREMENTS

- As stipulated in 40 CFR 261.33, when 1,1,1-trichloroethane, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (see 40 CFR 261.5). [53 FR 13382 (4/22/88)]
- When 1,1,1-trichloroethane is a spent solvent, it is classified as a hazardous waste from a nonspecific source (F002), as stated in 40 CFR 261.31, and must be managed according to state and/or federal hazardous waste regulations. [40 CFR 261.31 (7/1/87)]

FIFRA REQUIREMENTS

- Unless designated as an active ingredient in accordance with paragraph (b) or (c) of this section, this substance, when used in antimicrobial products, is considered inert, having no independent pesticidal activity. The percentage of such an ingredient shall be included on the label in the total percentage of inert ingredients. [40 CFR 162.60 (7/1/87)]
- 1,1,1-Trichloroethane is exempted from the requirement of a tolerance for residues when used in the postharvest fumigation of citrus fruit. [40 CFR 180.1012 (7/1/87)]

MEMORANDUM FOR THE DIRECTOR
OF THE
FEDERAL BUREAU OF INVESTIGATION
U.S. DEPARTMENT OF JUSTICE
WASHINGTON, D.C. 20535
DATE: 10/1/87
BY: [signature]
(1000 (10/1/87))

XI MONITORING AND ANALYSIS METHODS

SAMPLING PROCEDURES

- Analyte: Methylchloroform, (1,1,1-Trichloroethane); Matrix: Air; Sampler: Solid sorbent tube (coconut shell charcoal, 100 mg/50 mg); Flow rate: 0.01-0.2 liters/minute; Volume: minimum: 0.5 liters at 350 ppm, maximum: 6 liters; Stability: at least 1 week at 25 Deg C [124]
- Vapor concentration in work areas may be measured by monitoring breathing zone concentration and by use of expired breath analysis in post-exposure period in order to estimate magnitude of exposure. [30]

ANALYTIC LABORATORY METHODS

- Analyte: Methyl chloroform, (1,1,1-Trichloroethane); Matrix: air; Absorption: Solid sorbent tube (coconut shell charcoal); Desorption: 1 ml carbon disulfide; Procedure: Gas chromatography/flame ionization detection; Range: 0.6-17 mg/samp; Precision: 0.018; Estimated LOD: 0.01 mg/samp; Interferences: none [124]
- Laser absorption spectroscopy at 9-11 um has been used to determine 1,1,1-trichloroethane in air samples either alone, with limit of detection of 29 mg/cuM (5.3 ppm), or in a mixture of gases, with a limit of detection of 50 mg/cu M (9.2 ppm) (green and steinfeld, environ sci technol 10: 1134-39, 1976). [4]
- Sample type: water; extraction/cleanup: sparge (helium), trap on polymer column, desorb by heating, retrap in line on GC column; Detection: gas chromatography/flame ionization detection. [125]
- EPA Method 1624: An isotope dilution gas chromatography/ mass spectrometry method for the determination of volatile organic compounds in municipal and industrial discharges is described. This method is designed to meet the survey requirements of Effluent Guidelines Division (EGD) and the National Pollution Discharge Elimination System (NPDES). Under the prescribed conditions, unlabeled 1,1,1-trichloroethane has a minimum level of 10 ug/l and a mean retention time of 999 sec. The labeled compound has a minimum level of 10 ug/l, a mean retention time of 989 sec, and a characteristic primary m/z of 97/102. This method has an initial precision of 5.9 ug/l, an accuracy of 10.5-33.4 ug/l, and a labeled compound recovery of 12-200%. [40 CFR 136 (7/1/87)]
- EPA Method 601 A purge and trap gas chromatography method for the analysis of 1,1,1-trichloroethane in municipal and industrial discharges, consists of a stainless steel column, 8 ft x 0.1 in ID, packed with Carbowax B (60/80 mesh) coated with SP-1000, with electrolytic conductivity detection, and helium as the carrier gas at a flow rate of 40 ml/min. A sample injection volume of 2 to 5 ul is suggested, the column temperature is held isothermal at 45 Deg C for 3 minutes then programmed at 8 Deg/min to final temperature of 220 Deg C. This method has a detection limit of 0.03 ug/l and an overall precision of 0.02 times the average recovery + 0.37, over a working range of 8.0 to 500 ug/l. [40 CFR 136 (7/1/87)]

- EPA Method 624: A purge and trap gas chromatography/mass spectrometry method for the analysis of 1,1,1-trichloroethane in municipal and industrial discharges, consists of a glass column, 6 ft x 0.1 in, packed with Carbowax B (60/80 mesh) coated with 1% SP-1000, with the detection performed by the mass spectrometer, and helium as the carrier gas at a flow rate of 30 ml/min. A sample injection volume of 2 to 5 ul is suggested, the column temperature is held isothermal at 45 Deg C for 3 minutes and then programmed at 8 Deg/min to a final temperature of 220 Deg C. This method has a detection limit of 3.8 ug/l and an overall precision of 0.21 times the average recovery - 0.39, over a working range of 5 to 600 ug/l. [40 CFR 136 (7/1/87)]
- Method 8010: Halogenated Volatile Organics. For the analysis of solid waste, a representative sample (solid or liquid) is collected in a standard 40 ml glass screw-cap VOA vial equipped with a Teflon-faced silicone septum. Sample agitation, as well as contamination of the sample with air, must be avoided. Two vials are filled per sample location, then placed in separate plastic bags for shipment and storage. Samples may be analyzed by direct injection or purge-and-trap using gas chromatography, with detection achieved with a halogen-specific detector. A temperature program is used in the gas chromatograph to separate the organic compounds. Column 1 is an 8-ft by 0.1-in I.D. stainless steel or glass column packed with 1% SP-1000 on Carbowax-B 60/80 mesh or equivalent. Column 2 is a 6-ft by 0.1-in I.D. stainless steel or glass column packed with chemically bonded n-octane on Porasil-C 100/120 mesh (Durapak) or equivalent. Under the prescribed conditions, 1,1,1-Trichloroethane a detection limit of 0.03 ug/l, an average recovery range of four measurements of 10.8-24.8 ug/l, and a limit for the standard deviation of 4.9 ug/l. [126]
- Method 8240: Gas Chromatography/Mass Spectrometry for Volatile Organics Method 8240 can be used to quantify most volatile organic compounds that have boiling points below 200 C and that are insoluble or slightly soluble in water, including the title compound. Volatile water-soluble compounds can be included in this analytical technique, however, for the more soluble compounds, quantitation limits are approximately ten times higher because of poor purging efficiency. The method is also limited to compounds that elute as sharp peaks from a GC column packed with graphitized carbon lightly coated with a carbowax (6-ft by 0.1-in I.D. glass, packed with 1% SP-1000 on Carbowax-B (60/80 mesh) or equivalent). This gas chromatography/mass spectrometry method is based on a purge-and-trap procedure. The practical quantitation limit (PQL) for Method 8240 for an individual compound is approximately 5 ug/kg (wet weight) for wastes and 5 ug/l for ground water. PQLs will be proportionately higher for sample extracts and samples that require dilution or reduced sample size to avoid saturation of the detector. A representative sample (solid or liquid) is collected in a standard 40 ml glass screw-cap VOA vial equipped with a Teflon-faced silicone septum. Sample agitation, as well as contamination of the sample with air, must be avoided. Two vials are filled per sample location, then placed in separate plastic bags for shipment and storage. Under the prescribed conditions, 1,1,1-trichloroethane has an average recovery range for four samples of 13.7-30.1 ug/l with a limit for the standard deviation of 4.6 ug/l and a retention time of 13.4 min. [126]

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X SAFE HANDLING AND DISPOSAL

FIRE POTENTIAL

- It burns only in excess of oxygen or in air if a strong source of ignition is present. [129]
- Moderately flammable at higher temp. [130]
- An accidental explosion during a welding operation on a 1050 cuM tank holding 70 metric tons of inhibited 1,1,1-trichloroethane under nitrogen to exclude moisture is described. An investigation revealed that the storage tank did not contain any residual contamination from previous products and the 1,1,1-trichloroethane was not contaminated with highly flammable liquids. During the purging of the pipeline, a volume of nitrogen equivalent to approximately 1/2 tank volume had been injected near the base of the tank. The amount of nitrogen added manually, through the roof of the tank, could not be quantified. It was determined that inerting the tank by nitrogen had been insufficient and that a flammable Concentration of 1,1,1-trichloroethane occupied a portion of the tank near the top and was ignited by heat from welding. Although chlorinated hydrocarbons are often regarded as non-flammable, 1,1,1-trichloroethane for hot work purposes should be treated as highly flammable. [131]

NFPA HAZARD CLASSIFICATION

- Health: 2. 2- Materials hazardous to health, but areas may be entered freely with self-contained breathing apparatus. [130]
- Flammability: 1. 1- Materials that must be preheated before ignition can occur. Water may cause frothing of liquids if it gets below the surface of the liquid and turns to steam. Water spray gently applied to the surface will cause a frothing which will extinguish the fire. [130]
- Reactivity: 0. 0- Materials which are normally stable even under fire exposure conditions and which are not reactive with water. Normal fire fighting procedures may be used. [130]

FIRE FIGHTING INFORMATION

FIRE FIGHTING PROCEDURES

- Dry chemical, foam, or carbon dioxide [24]
- Wear self-contained breathing apparatus when fighting fire. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures. [130]

TOXIC COMBUSTION PRODUCTS

TOXIC COMBUSTION PRODUCTS
Toxic and irritating gases are generated in fires. [24]

OTHER FIRE FIGHTING HAZARDS

- Burning rate: (est) 2.9 mm/min [24]

WARNING PROPERTIES

ODOR THRESHOLD

- 44 ppm [29]

SKIN, EYE AND RESPIRATORY IRRITATIONS

- Vapors cause a slight smarting of the eyes or respiratory system if present in high Concentration. Vapors: Irritating to nose and throat. Liquid: irritating to eyes. [24]
- If the liquid is spilled on clothing and allowed to remain, may cause smarting and reddening of the skin. [24]

PROTECTIVE EQUIPMENT and CLOTHING

- Organic vapor-acid gas canister; self-contained breathing apparatus for emergencies; neoprene or polyvinyl-alcohol-type gloves; chemical safety goggles and face shield; neoprene safety shoes (or leather safety shoes plus neoprene footwear); neoprene or polyvinyl alcohol suit or aprons for splash protection. [24]
- The permeation rates of solvents including 1,2-dichloroethane, 1,1,1- or 1,1,2- trichloroethane through protective garment rubber materials are less than 6.36 min/ml, except for unwrinkled Teflon and Viton with greater than 720 and 82 to greater than 144 min/ml, respectively. [134]
- Respirator selection (NIOSH): Emergency or planned entry in unknown Concentration or IDLH conditions: Any self-contained breathing apparatus with a full facepiece and operated in pressure-demand or other positive pressure mode or any supplied-air respirator with full facepiece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode. [122]
- Respirator selection (NIOSH): Escape: Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister or any appropriate escape-type self-contained breathing apparatus. [122]

PREVENTIVE MEASURES

- Contact lenses should not be worn when working with this chemical. [122]
- Contact lens use in industry is controversial. A survey of 100 corporations resulted in the recommendation that each company establish their own contact lens use policy. One presumed hazard of contact lens use is possible chemical entrapment. Many authors found that contact lens minimized injury or protected the eye. The eye was afforded more protection from liquid irritants. The authors concluded that soft contact lens do not worsen corneal damage from strong chemicals and in some cases could actually protect the eye. Overall, the literature supports the wearing of contact lenses in industrial environments as part of the standard eye protection, eg face shields; however, more data are needed to establish the value of contact lenses. [135]

- Promptly remove non-impervious clothing that becomes contaminated. [122]
- Contaminated protective clothing should be segregated in such a manner so that there is no direct personal contact by personnel who handle, dispose, or clean the clothing. Quality assurance to ascertain the completeness of the cleaning procedures should be implemented before the decontaminated protective clothing is returned for reuse by the workers. [2]

SHIPMENT METHODS AND REGULATIONS

- Whenever hazardous materials are to be transported, Title 49 CFR, Transportation, Parts 100-180, published by the US Dept of Transportation, contain the regulatory requirements and must be consulted. [52 FR 16482 (5/5/87)]
- International Air Shipments: Shipping description: 1,1,1-Trichloroethane, IMO 6.1, UN 2831. Label(s) required: Keep away from food. Packaging Instructions: 5.6.605 (passenger); 5.6.612 (cargo). [2]
- Water shipments: Shipping description: 1,1,1-Trichloroethane, IMO 6.1, UN 2831. Label(s) required: Keep away from food. [136]
- Shipping description: 1,1,1-Trichloroethane, IMO 6.1, UN 2831. Label(s) required: Keep away from food. Acceptable Modes of transportation: Air, rail, road, and water. [52 FR 16660 (5/5/87)]

STORAGE CONDITIONS

- Storage temperature: Ambient; Venting: Pressure-vacuum. [24]
- Store in a cool, dry, well-ventilated location, away from any area where the fire hazard may be acute. [130]
- Do not store in aluminum containers. [26]

CLEANUP METHODS

- 1. Ventilate area of spill or leak. 2. Collect for reclamation or absorb in vermiculite, dry sand, earth, or a similar material. [32]
- Environmental considerations, land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. If time permits, pits, ponds, lagoons, soak holes, or holding areas should be sealed with an impermeable flexible membrane liner. Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete; absorb bulk liquid with fly ash, cement powder, or commercial sorbents. [137]
- Environmental considerations, water spill: Use natural barriers or oil spill travel, use natural deep water pockets, excavated lagoons, or sand bag barriers to trap material at bottom, remove trapped material with suction hoses. [137]

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DISPOSAL METHODS

- At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices. [2]
- 1,1,1-Trichloroethane should be incinerated after being combined with another combustible fuel. Care must be exercised to assure complete combustion to prevent the formation of phosgene. An acid scrubber is necessary to remove halo acids produced. Dilute with kerosene or fuel oil due to high chlorine content. Evaporation of small amounts was also recommended. ... [138]
- USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-51 (1982)Chemical Treatability of 1,1,1-Trichloroethane; Concentration Process: Biological treatment; Chemical Classification: Halocarbon; Scale of Study: Full scale, continuous flow; Type of Wastewater Used: Industrial waste; Results of Study: Effluent concentration: 1.0-20.0 ppb (Survey of 2 municipal wastewater treatment plants). [2]
- USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-105 (1982)Chemical Treatability of 1,1,1-Trichloroethane; Concentration Process: Stripping; Chemical Classification: Halocarbon; Scale of Study: Literature review; Type of Wastewater Used: Unknown; Results of Study: Air and Steam Strippable. [2]
- A potential candidate for liquid injection incineration at a temperature range of 650 to 1,600 Deg C and a residence time of 0.1 to 2 seconds. A potential candidate for rotary kiln incineration at a temperature range of 820 to 1,600 Deg C and residence times of seconds for liquids and gases, and hours for solids. A potential candidate for fluidized bed incineration at a temperature range of 450 to 980 Deg C and residence times of seconds for liquids and gases, and longer for solids. [139]
- USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-105 (1982)Chemical Treatability of 1,1,1-Chloroethane; Concentration Process: Stripping; Chemical Classification: Halocarbon; Scale of Study: Pilot scale, continuous flow; Type of Wastewater Used: Industrial waste; Results of Study: Overhead flow (% of feed) 2.5 with 0.9:1 reflux to overhead ratio, overhead concentration: 173.4 ppm, bottom concentration: 41.6 ppm; (Water quality: TOC: 9022 ppm, COD (chemical oxygen demand): 15100 ppm, pH: 0.1, acidity: 102312 ppm, Cl: 116, 127 ppm numerous halogens present). [2]
- USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-117 (1982)Chemical Treatability of 1,1,1-Trichloroethane; Concentration Process: Solvent extraction; Chemical Classification: Halocarbon; Scale of Study: Literature review; Type of Wastewater Used: Unknown; Results of Study: Extractable with alcohols and aromatics. [2]
- USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-160 (1982)Chemical Treatability of 1,1,1-Trichloroethane; Concentration Process: Activated carbon; Chemical Classification: Halocarbon; Scale of Study: Literature review; Type of Wastewater Used: Unknown; Results of Study: Reported to be adsorbed. [2]

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- DOT EMERGENCY GUIDELINES

- [illegible]

XI SPECIAL REPORTS

- Astrand I; Uptake of solvents in the blood and tissues of man. A review; scand J Work-Environ-Health 1 (4): 199-218 (1975). A review of results from studies on uptake in humans.
- Walter P et al; Chlorinated Hydrocarbon Toxicity (1,1,1-trichloroethane, trichloroethylene, and tetrachloroethylene): A monograph; US NTIS, 1976 PB-257185). A review with 91 references. Results of the 1920-1975 literature study on physical and chemical properties, analytical methods, occurrence, use by industry, use in consumer products, breakdown, short-term toxicology studies, long-term toxicology studies, absorption-distribution, metabolism-excretion, effects on enzymes and drug interactions.
- Toxicology Review: Fortschritte der Arzneimittelforschung 18: 365 (1974)
- Toxicology Review: US Army, Edgewood Arsenal Technical Report EB-TR-75047
- Toxicology Review: American Industrial Hygiene Association Journal 40: A46 (1979)
- Toxicology and Carcinogenesis Studies of 1,1,1-Trichloroethane Report# 3 (1976) NIH Pub# 77-803
- NIOSH; Current Intelligence Bulletin Chloroethanes (1978)

XII BIBLIOGRAPHY

- [1] Windholz M - Budavari S ; The Merck Index; 10th ed. Rahway, NJ : Merck & Co. 1983.
- [2] Toxicology Branch; Hazardous Substances Data Bank; Bethesda, Md : National Library Of Medicine 1990
- [3] Grayson M - Kirk RE - Mark HF - Othmer DF - Eckroth D ; Kirk-Othmer Encyclopedia of Chemical Technology ; 3d ed. New York : Wiley, 1978
- [4] IARC MONOGRAPHS. 1972-PRESENT V20 516 (1979)
- [5] National Institute for Occupational Safety and Health; Criteria Document: 1,1,1-Trichloroethane 1976 DHEW Pub. NIOSH 76-184
- [6] Stewart RD et al; Arch Environ Health 19 (4): 467-72 (1969)
- [7] Kunev JH - Mullican JM; Chemcyclopedia; Washington, DC : American Chemical Society 1988
- [8] Flick EW; Industrial Solvents Handbook; 3rd ed. Park Ridge, NJ : Noyes Publication 1988
- [9] Toxicology Branch; Hazardous Substances Data Bank; Bethesda, Md : National Library Of Medicine 1990
- [10] Meister RT; Farm Chemicals Handbook; Willoughby, OH : Meister Publishing Co. 1987
- [11] Browning E; Toxicology and Metabolism of Industrial Solvents; New York : American Elsevier 1965
- [12] Hamilton A - Hardy HL ; Industrial Toxicology ; 3d ed. Acton, Mass. : Publishing Sciences Group 1974
- [13] Meister RT; Farm Chemicals Handbbok 1984; Willoughby, OH : Meister Publishing Co. 1984
- [14] Sax NI - Lewis RJ Sr.; Hawleys Condensed Chemical Dictionary; 11the ed New York : Van Nostrand Reinhold Co. 1987
- [15] Kavalier AR; Chemical Marketing Reporter; New York : Schnell Publishing Co. Inc. 1984
- [16] National Institute for Occupational Safety and Health. Criteria Document: 1,1,1-Trichloroethane 1976 DHEW Pub No 76-184
- [17] U.S. International Trade Ccommission; Syn Organic Chem US Prod & Sales 1982. USITC Pub 1292
- [18] U.S. International Trade Commission; Synthetic Organic Chemicals -- United States Production and Sales; Washington, DC : United Staes International Trade Commission 1985
- [19] U.S. International Trade Commission; Synthetic Organic Chemicals -- United States Production and Sales; Washington, DC : United Staes International Trade Commission 1987
- [20] Chemical Products Synopsis: 1,1,1-Trichloroethane, 1985
- [21] U.S. Bureau of the Census; U.S. Exports, Schedule E, 1985
- [22] U.S. Bureau of the Census; U.S. Exports, Schedule E, AUG 1987
- [23] Clayton GD - Clayton FE; Patty's Industrial Hygiene and Toxicology; 3rd ed three volumes New York : John Wiley and Sons 1981
- [24] United States Coast Guard; CHRIS - Hazardous Chemical Data; Vol II Washington, DC : U.S. Coast Guard; U.S. Department of Transportation 1984
- [25] Weast RC; Handbook of Chemistry and Physics; 68th ed. Boca Raton, FL : CRC Press, Inc 1987
- [26] International Technical Institute; Toxic and Hazardous Industrial Chemicals Safety Manual; Tokyo, Japan : The International Technical Institute 1982

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- [54] American Conference of Governmental Industrial Hygienists; Documentation of the Threshold Limit Value; 4th ed. Cincinnati, Ohio : American Conference of Governmental Industrial Hygienists 1980
- [55] Caplan YH et al; Clin Toxicol 9 (1): 69-74 (1976)
- [56] Stewart RD; J Amer Med Ass 215 (11): 1789-92 (1971)
- [57] Gerace RV; Ann Emerg Med 10 (10): 533-4 (1981)
- [58] Gamberale F - Hultengren M; Work-Environ-Health 10 (2): 82-92 (1973)
- [59] Stewart RD et al; Arch Environ Health 19 (4): 467-72 (1969)
- [60] U.S. Environmental Protection Agency; Health Assessment Document: 1,1,1-Trichloroethane 1982 EPA-600/8-82-003
- [61] Maroni M et al; Scand J Work Environ Health 3: 16-22 (1977) as cited in U.S. Environmental Protection Agency; Health Assessment Document: 1,1,1-Trichloroethane p.5-9 & 5-53 (1982) EPA-600/8-82-003
- [62] Seki Y et al; Int Arch Arbeitsmed 34: 39-49 (1975) as cited in U.S. Environmental Protection Agency; Health Assessment Document: 1,1,1-Trichloroethane p.5-9 & 5-53 (1982) EPA-600/8-82-003
- [63] King GS et al; J Amer Med Assoc 253: 1604-6 (1985)
- [64] Grant WM; Toxicology of the Eye; 3rd ed Springfield, IL : Charles C. Thomas Publisher 1986
- [65] Ghittori S et al; Am Ind Hyg Assoc J 48 (9): 786-90 (1987)
- [66] Klaassen CD - Plaa GL; Toxicol Appl Pharmacol 10: 119-31 (1967)
- [67] Klaassen CD - Plaa GL; Toxicol Appl Pharmacol 9 (1): 139-51 (1966)
- [68] Carcinog Tech Rep Ser - National Cancer Institute (US): 70 pages (1977) ISS NCI-CG-TR-3
- [69] Herd PA et al; Arch Environ Health 28 (4): 227-33 (1974)
- [70] Larsby B et al; Int Arch Occup Environ Health 41 (1): 7-16 (1978)
- [71] Prendergast JA et al; Toxicol Appl Pharmacol 10 (2): 270-89 (1967)
- [72] Gocke E et al; Mutat Res 90 (2): 91-109 (1981)
- [73] Kronevi T et al; Int J Tissue React 3 (1): 21-30 (1981)
- [74] Lane RW et al; Toxicol Appl Pharmacol 63 (3): 409-21 (1982)
- [75] Shepard TH; Catalog of Teratogenic Agents; 5th ed Baltimore, MD : The John Hopkins University Press 1986
- [76] McNutt NS et al; Lab Invest 32: 642-54 (1975)
- [77] Elovaara et al; Toxicol 12: 111 (1979) as cited in U.S. Environmental Protection Agency; Health Assessment Document: 1,1,1-Trichloroethane p.5-35 (1982) EP-600/8-82-003
- [78] Price PJ et al; In Vitro 14: 290-3 (1978) as cited in U.S. Environmental Protection Agency; Health Assessment Document: 1,1,1-Trichloroethane p.7-16 to 7-17 (1982) EPA-600/8-82-003
- [79] Rampy LN et al; Proc Int Cong Toxicol p.27 (1977) as cited in U.S. Environmental Protection Agency; Health Assessment Document: 1,1,1-Trichloroethane p.5-40 (1982) EPA-600/8-82-003
- [80] Tsapko VG, Rappoport MB; Farmakol Toksikol 7: 149-51 (1972) as cited in National Institute for Occupational Safety and Health; Criteria Document: 1,1,1-Trichloroethane p.43 (1979) DHEW Pub. NIOSH 79-184
- [81] Naylor Dana Institute; DNA Repair Tests of 11 Chlorinated Hydrocarbon Analogs, Final Report. (1983), EPA Document No. 40-8324292, Fiche No. OTS0509403
- [82] Arthur D. Little, Inc.; Cell Transformation Assays of 11 Chlorinated Hydrocarbon Analogs, Final Report. (1983), EPA Document No. 40-8324457, Fiche No. OTS0509392
- [83] Dow Chemical Toxicology Research Laboratory; Chloroethene VG: A Chronic Inhalation Toxicity and Oncogenicity Study in Rats and Mice, Part I Results of Findings in Mice, Final Report. (1984), EPA Document No. 40-8424460, Fiche No. OTS0509395

- [100] (1) Wilson JT et al; Devel Indust Microbiol 24:225-33 (1983) (2) Bouwer EJ et al; Water Res 15:151-9 (1981) (3) Bouwer EJ, McCarty PL; Appl Environ Microbiol 45:1286-94 (1983) (4) Tabak HH et al; J Water Pollut Control Fed 53:1503-18 (1981) (5) Pearson CR, McConnell G; Proc Roy Soc London B 189:305-32 (1975) (6) Mudder TI; Amer Chem Soc Div Environ Chem p 52-3, Kansas City, MO (1982) (7) Parsons F, Lage GB; J Am Water Works Assoc 77: 52-9 (1985) (8) McCarthy PL et al; Groundwater Pollut Microbiol pp. 89-115 (1984)
- [101] (1) Callahan MA et al; Water-Related Environmental Fate of 129 Priority Pollutants Vol II page 45-1 to 45-12 EPA-440/4-79-029B (1979) (2) Dilling WL et al; Environ Technol 9:833-8 (1975) (3) Hubrich C, Stuhl F; J Photochem 12:93-107 (1980) (4) Singh HB et al; Atmos Environ 15:601-12 (1981) (5) Hampson RF; FAA-EE-80-17, US Dept of Transportation (1980) (6) Pearson CR, McConnell G; Proc Roy Soc London B 189:305-32 (1975) (7) Spence JW, Hanst PL; J Air Pollut Control Fed 28:250-3 (1978) (8) Dilling WL et al; Environ Sci Technol 10:351-6 (1976) (9) Buchardt O, Manscher OH; CEC Proceedings, 2nd Meeting (1978) (10) Singh HB et al; Environ Sci Technol 16:872-80 (1982) (11) Haag WR et al; Am Chem Soc Div Environ Chem Preprint 26: 248-53 (1986) (12) Atkinson R; Chem Rev 85: 69-201 (1985)
- [102] (1) Barrows ME et al; Dyn Exp Hazard Assess Toxic Chem Ann Arbor Mi: Ann Arbor Sci p. 379-92 (1980) (2) Davies RP, Dobbs AJ; Ater Res 18: 1253-62 (1984)
- [103] Frankenberry M et al; Household products containing methylene chloride and other chlorinated solvents: A shelf survey. Rockville, MD: Westat Inc (1987)
- [104] (1) Coniglio WA et al; EPA Briefing. Criteria and Standards Div. Sci Technol Branch. Exp Assess Proj p. 16 (1980) (2) Brumaster DE; Environ 24: 6-13, 33-6 (1982) (3) Wallace LA et al; Environ Res 43: 290-307 (1987) (4) Contruvo JA; Sci Tot Environ 47: 7-26 (1985)
- [105] Coniglio WA et al; EPA Briefing. Criteria and Standards Div. Sci Technol Branch. Exp Assess Proj p. 16 (1980)
- [106] (1) Coniglio WA et al; EPA Briefing. Criteria and Standards Div. Sci Technol Branch. Exp Assess Proj p. 16 (1980) (2) Ohio River Valley Water Sanit Comm; Assess of Water Qual Cond 1980-81 Cincinnati, OH (1982) (3) Ewing BB et al; Monitoring To Detect Previously Undetected Pollutants In Surface Waters. Appendix: Organic Analysis Data p 1-129 EPA-560/6-77-015A (1977) (4) Pellizzari ED et al; Formulation of Preliminary Assessment of Halogenated Organic Compounds In Man and Environmental Media p. 38-94 EPA-560/13-79-006 (1979) (5) Battelle Columbus Labs; Multimedia Levels Methylchloroform p. 2.1-2.22 EPA-560/6-77-030 (1977)
- [107] Pearson CG, McConnell G; Proc Roy Soc London B 189: 305-32 (1975)
- [108] (1) Pearson CR, McConnell G; Proc Roy Soc London B 189: 305-32 (1975) (2) Kawamura K, Kaplan LR; Environ Sci Technol 17: 497-501 (1983) (3) Su C, Goldberg ED; Marine Pollut Tfr HL Windom et al eds Lexington MA: DC Heath Co p. 353-74 (1976)
- [109] (1) U.S. Environmental Protection Agency; Treatability Manual page I.12.8-1 to I.12.8-4 EPA-600/2-82-001a (1982) (2) Battelle Columbus Labs; Multimedia levels methylchloroform p 2.1-2.22 (1977)
- [110] Shackelford WM et al; Analyt Chim Acta 146: 15-27 (1983)
- [111] (1) Pearson CR, McConnell G; Proc Roy Soc London B 189:305-32 (1975) (2) Battelle Columbus Labs; Multimedia Levels Methylchloroform p 2.1-2.22 EPA-560/6-77-030 (1977)
- NOT RECORDED BY THE NATIONAL ARCHIVES
(9-60-2.U.S.I. 0117)

- [112] (1) Rasmussen RA et al; Science 211: 285-7 (1981) (2) Singh HB et al; Atmospheric distribution, sources and sinks of selected halocarbons, hydrocarbons, SF6 and N2O. p. 114-22 EPA-600/3-79-107 (1979) (3) Brodzinsky R, Singh HB; Volatile organic chemicals in the atmosphere: an assessment of available data. p. 12-5 SRI Inter contract 68-02-3452 (1982) (4) Bozzelli JW, Kebbekus BB; Analysis of selected volatile organic substances in ambient air. Air Force Final Report, Apr-Nov 1978 Newark, NJ: NJ Inst Technol p. 80 (1979) (5) Singh HB et al; Atmos Environ 15: 601-12 (1981) (6) Singh HB et al; Atmospheric measurement of selected hazardous organic chemicals EPA-600/S3-81-032 (1981) (7) Pellizzari ED et al; Formulation of preliminary assessment of halogenated organic compounds in man and environmental media p 38-94 EPA-560/13-79-006 (1979) (8) Wallace LA et al; Environ Res 43: 290-307 (1987) (9) Wallace LA et al; Atmos Environ 21: 385-93 (1987) (10) Class T, Ballschmitter K; Chemosphere 15: 413-27 (1986)
- [113] (1) McConnell G et al; Endeavor 34:13-8 (1975) (2) Heikes DL, Hopper ML; J Assoc Off Anal Chem 69: 990-8 (1986)
- [114] (1) Dickson AG, Riley JP; Marine Pollut Bull 7:167-70 (1976) (2) Pearson CR, McConnell G; Proc Roy Soc London B 189:305-32 (1975)
- [115] Battelle Columbus Laboratories; Multimedia levels methyl chloroform. EPA-560/6-77-030 p 5-3 (1977)
- [116] Pellizzari ED et al; Environ Sci Technol 16: 781-5 (1982)
- [117] Arena JM; Poisoning - Toxicology, Symptoms, Treatment; 5th ed Springfield, IL : Charles C. Thomas Publisher 1986
- [118] (1) U.S. Environmental Protection Agency; Ambient Water Quality Criteria for Chlorinated Ethane p. C5-C13 EPA-440/5-80-029 (1980) (2) Dunovant VS et al; J Water Pollut Control Fed 58: 886-95 (1986)
- [119] (1) McConnell G et al; Endeavour 34: 13-8 (1975) (2) Barkley J et al; Biomed Mass Spectrom 7: 139-47 (1980) (3) Pellizzari ED et al; Environ Sci Technol 16: 78-5 (1982) (4) Hajimiragha H et al; Int Arch Occup Environ Health 58: 141-50 (1986) (5) Antoine SR et al; Bull Environ Contam Toxicol 36: 364-71 (1986) (6) Wallace LA et al; Environ Res 43: 290-307 (1987)
- [120] (1) Schwarzenbach RP et al; Environ Sci Technol 17: 472-9 (1983) (2) Dilling WL et al; Environ Sci Technol 9: 833-8 (1975) (3) Chiou CT et al; Science 206: 831-2 (1979) (4) Friesel P et al; Fresenius Z Anal Chim 319: 160-4 (1984) (5) Richter RO; Am Chem Soc Div Environ Chem Preprints 23: 193-4 (1983) (6) Urano K, Murata C; Chemosphere 14: 293-9 (1985) (7) Hellmann H; Dtsch Gewaesserkd Mitt 29: 111-5 (1985)
- [121] (1) Shen TT; J Air Pollut Control Assoc 32: 79-82 (1982) (2) Dilling WL et al; Environ Sci Technol 9: 833-8 (1975) (3) Wakeham SG et al; Environ Sci Technol 17: 611-7 (1983) (4) Lyman WJ et al; pp. 15-1 to 15-43 in Handbook of Chem Property Estimation Methods NY: McGraw-Hill (1982) (5) Okouchi S; Wat Sci Tech 18: 137-8 (1986)
- [122] National Institute for Occupational Safety and Health; NIOSH Pocket Guide to Chemical Hazards; Cincinnati, Ohio : National Institute for Occupational Safety and Health
- [123] American Conference of Governmental Industrial Hygienists; Documentation of the Threshold Limit Value; 4th ed. Cincinnati, Ohio : American Conference of Governmental Industrial Hygienists 1980
- [124] Eller PM; NIOSH Manual of Analytical Methods; 3rd ed. Cincinnati, Ohio : National Institute for Occupational Safety and Health 1984
- [125] Coleman et al; Keith LH; ed, Identification and Analysis of Organic Pollutants in Water, Ann Arbor, MI, Ann Arbor Science pp 305-27 (1976)

- [126] U.S. Environmental Protection Agency; Test Methods for Evaluating Solid Waste SW-846 (1986)
- [127] Skovronek HS et al; 12th Annual Research Symp Land Disp, Remedial Action, Incin Treat Haz Wastes p.1-8 (1986)
- [128] Lopez-Avila V et al; J Chromatogr Sci 25 (7): 286-91 (1987)
- [129] American Conference of Governmental Industrial Hygienists; Documentation of the Threshold Limit Value; 4th ed. Cincinnati, Ohio : American Conference of Governmental Industrial Hygienists 1980
- [130] National Fire Protection Association; Fire Protection Guide on Hazardous Materials; 9th ed Boston, MA : National Fire Protection Association 1986
- [131] Wrightson I, Santon RC; IChE Loss Prev Bull 83: 21 (1988)
- [132] Bretherick L; Handbook of Reactive Chemical Hazards; 3rd ed Boston, MA : Butterworths 1985
- [133] Sax NI - Bracken MC ; Dangerous Properties of Industrial Materials ; 6th ed. New York : Van Nostrand Reinhold 1984
- [134] Weeks RW, McLeod MJ; ACS Symp Ser 149 (ISS Chem Hazard Workplace: Meas Control); 235-67 (1981)
- [135] Randolph SA, Zavon MR; J Occup Med 29: 237-42 (1987)
- [136] International Maritime Organization; International Maritime Dangerous Goods Code; International Maritime Organization (1986)
- [137] Association of American Railroads; Emergency Handling of Hazardous Materials in Surface Transportation; Washington, DC : Association of American Railroads, Hazardous Materials Systems 1987
- [138] United Nations; Treatment and Disposal Methods for Waste Chemicals - Data Profile Series No. 5; Geneva, Switzerland : United Nations Environmental Programme, 1985
- [139] U.S. Environmental Protection Agency; Engineering Handbook for Hazardous Waste Incineration p.3-16 (1981) EPA 68-03-3025
- [140] Department of Transportation; Emergency Response Guidebook.; Washington, DC : U.S. Dept. of Transportation, Research and Special Programs Administration, Materials Transportation Bureau
- [141] National Toxicology Program; Division of Toxicology Research and Testing; Management Status Report; 07/13/88;
- [142] Torkelson, TR - Oyen F - McCollister DD - Rowe VK; Toxicity of 1,1,1-trichloroethane as determined on laboratory animals and human subjects; Am Ind Hyg Assoc J 1958 19:353-362
- [143] Adams EM - Spencer HC - Rowe VK - Irish DD; Vapor toxicity of 1,1,1-trichloroethane (methyl chloroform) determined by experiments on laboratory animals; Arch Ind Hyg Occup Med 1950 1:225-236
- [144] U.S. Environmental Protection Agency; Intergrated Risk Information System (IRIS) database; Washington, DC : U.S. Environmental Protection Agency 1990

INSLAW, Inc.

ANALYTIC SUPPORT

The information that accumulates as a result of the operation of an automated system provides a rich source of data for quantifiable assessments of the client's operations, for evaluations of the impact of managerial decisions, and for analyses in support of litigation and policy making.

INSLAW's research staff is available to provide analytic support to clients. The research staff includes economists, statisticians, operations research specialists, and others skilled in quantitative analysis of automated and manual data bases.

Examples of the types of analyses that can be conducted include the following:

- Analyses to identify resource allocation and other office management problems.
- The development of models that predict the "average" or "probable" outcome of a case on the basis of varying case attributes, e.g., the average settlement amounts for tort cases, depending on the issues involved, the amount in controversy, and so on.
- The preparation of quantitative evidence in cases involving questions of statistical inference.
- The development of "what if" models that use information in the data base to answer hypothetical questions about the implications of pursuing a particular action.
- Analyses of the costs of providing legal and other services and of the profitability of pursuing particular kinds of business.

APPLICABILITY OF PROMIS/GENTRAC SYSTEMS
TO MANY ENVIRONMENTS

CANADA

"It (PROMIS) can be used independently by a court, prosecutor, law enforcement agency, etc., or jointly by a number of agencies The documentation is continually being updated and is very complete in describing system details."

"The fact that PROMIS is now operational in Alberta and has been well received there is proof positive that the system is suitable for transfer to Canadian jurisdictions NWG findings indicate that the system performs its functions 'as advertised' by INSLAW. Alberta (has) found that the system is operationally effective."

"NWG personnel found on-line data entry and inquiry facilities to be powerful while at the same time being relatively easy to use. This was confirmed by the Alberta PROMIS manager who estimates that a person with no knowledge of the application area can learn how to interact with PROMIS effectively and learn the relevant subject matter in approximately 3 weeks."

"In summary, the NWG has found that PROMIS is suitable for use by Canadian jurisdictions"

(The National Work Group on Justice Information and Statistics, An Overview of PROMIS, NWG Document No. 7, Canadian Centre for Justice Statistics, October 6, 1981)

BALTIMORE COUNTY, MARYLAND

"Even though our caseload continues to increase all the time, the system has allowed us to avoid hiring more people We can do now in 15 minutes what used to take three or four hours. It keeps a lid on the number of personnel."

(Renee Kelly, Chief of the Criminal Division of the Circuit Court Clerk's Office, quoted in The Towson Times, Dec. 23, 1982)

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SCOTLAND

"This office has carefully and closely examined the PROMIS package from its documentary material and has also similarly examined the application of it in prosecutors' offices in the United States of America. Our two Ministers (the Lord Advocate and the Solicitor General for Scotland) and officials have visited such offices in America and, as a result, are satisfied that the PROMIS package would meet our requirements."

". . . Dr. Whitfield [government official who conducted the study] concludes that the PROMIS package appears well-suited to the requirements of the Procurator Fiscal's office in Glasgow and the service which it provides to the Glasgow courts. One of the main advantages is the fact that the PROMIS package has been under continuous development since 1973 and is currently installed in over 60 court and prosecution administrations in the United States of America. . . . Furthermore, the long period of continuous development of the package should avoid many of the difficulties encountered with a specially written application software."

"In view of the correspondence of the findings of Dr. Whitfield with the results of the investigations and examinations conducted by this office, it is submitted that the PROMIS software package is not only an appropriate alternative to a specially written application software but that all the evidence proves that it is very well suited to the needs of the Procurator Fiscal's office in Glasgow."

(Scottish Crown Office, Proposed Computerisation of
Procurator Fiscal's Office in Glasgow, August 4, 1981)

GERMANY

"Summing up, it can be recommended that the implementation of automation devices for the simplification of office activities in the judicial system be realized by means of the program system PROMIS and the know-how offered by INSLAW."

"As already indicated PROMIS can be regarded as a basis for our implementation, the usage of which could save a two-digit number of programmer-man/years."

(Translated from Description of the PROMIS Program
Package and Evaluation of the Applicability within the
German Judicial System, Gesellschaft für Mathematik und
Datenverarbeitung mbH, Bonn, March 31, 1980)

U.S. OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

"PROMIS satisfies the great majority of OSHRC's requirements. The tailoring package would allow conversion of PROMIS to satisfy all of OSHRC's data requirements and the majority of the report requirements. Since PROMIS is written in COBOL, the few remaining report requirements could be easily satisfied. The tailoring package would also allow easy modification of OSHRC's data base to meet new requirements as they arise

". . . FEDSIM recommends PROMIS as OSHRC's best software alternative for satisfying its case tracking requirements."

(Federal Computer Performance Evaluation and Simulation Center (FEDSIM), Analysis of OSHRC Case Tracking System Alternatives, Washington, D.C., March, 1980)

ITALY

"In the criminal division . . . I can cite our intention to undertake, as soon as possible, an experimental initiative within the judicial organizations of Bologna or Salerno . . . It is necessary that the software chosen has been tested successfully by many organizations having the same institutional goals. This problem was already considered last year in the United States during a meeting of experts in the field, where, after repeated experimental verification, it became clear that it was necessary to use a computer system called PROMIS, whose adaptability and flexibility has, among other things, been proven in operation both in common law systems as well as in code law systems such as our own.

"The choice of a computer program which is already in existence, and which has been widely tested and used, is preferable for at least two principle reasons: because it allows a notable reduction of set-up time even if -- as always happens to a certain extent -- it is necessary to make adaptations for the unique operational requirements of different judicial organizations; and because, in the field of judicial administration, the applicable potentials of information systems are developed more efficiently and vigorously where the users of a system can periodically compare their experience, their successes, and their difficulties with those of other users of the same system on either a national or international level."

(Dr. Giuseppe Gargani, Under Secretary of State of the Ministry of Justice, translated from "The Computer and Justice," in Il Giorno, November 27, 1982)

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IRELAND

"The System has coped magnificently with the unexpected high caseload, and we have managed with only one extra staff member since November.

"The 'Inquiry' side of the System has proved most popular with the Court Staff and, because of the central source of information, our response to the Court information needs of the Public has improved greatly. The extraordinary flexibility of the Generalised Inquiry Package has been the highlight of the System as far as the Court Staff are concerned. We are now promptly responding to a large number of routine and non-routine requests for reports and information.

"The Management Report Package is providing the Courts and Gardai with a regular flow of data on our operations, and we can handle a wide range of statistical requests without requiring any programme assistance."

"Therefore I am pleased to inform you that PROMIS has most certainly lived up to our expectations."

(Denis O'Neill, Courts Computer Manager, Dublin
Metropolitan District Court, August 12, 1983)

MONTGOMERY COUNTY, MARYLAND

"PROMIS is much more than its name indicates, and as a comprehensive offender-based online criminal justice information system, it provides a real-time interagency network for each of the major elements of the criminal justice community for planning, management, and resource allocation

"More importantly, PROMIS can help us make crime a high risk venture for the criminal."

(Russell E. Hammill, Jr., Senior Assistant Chief
Administrative Officer, Montgomery County, MD, in PROMIS
at the State's Attorney's Office, Montgomery County, MD
International Business Machines Corp. Application Brief,
1982)

"The beauty of PROMIS is that you can check out the status of cases in terms of schedule over any time span you'd like, because it is online. If you decide on a printout every week of detainer cases, you can get it; if you want a report of all current bench warrant cases, you can get it; if you want a listing of all cases that are pending violations of probation or parole, you can get it. Nothing gets lost in

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the cracks; you can monitor everything If you have that information regularly available, you can begin to spot changing trends in criminal activity in your jurisdiction, and you can change the focus of your resources. Without an automated system, you cannot do it effectively . . .

"It's so flexible; you can do what you want with the system. By 1985, informational needs will change, but the state's attorney will not have to go out and buy a new computer system; he can tailor PROMIS to what he needs, and produce completely different kinds of reports."

(Robert M. Coyne, PROMIS System Manager, Montgomery County, MD, in PROMIS at the State's Attorney's Office in Montgomery County)

Executive Office for United States Attorneys

"The decision was then made to implement [PROMIS] on an experimental basis in two large United States Attorneys' offices and in two smaller offices. The pilot project began in October, 1979. . . . It was an integral part of this pilot study to determine whether the computers and word processing machines could generate in an efficient manner, the detailed statistics needed to fulfill the management needs of individual United States Attorney's offices, while at the same time capturing and delivering to Department of Justice headquarters the more general data needed for long-range planning and resource allocation."

"On the basis of the pilot study, the Department of Justice in 1981 decided to implement PROMIS, as developed and refined for these four offices, throughout the remaining United States Attorneys' offices. . . . The Department of Justice, and in particular the United States Attorneys' offices which constitute its major litigating component, is committed to the idea that the efficiencies made possible by technological progress in information systems and hardware should be employed to improve the administration of justice."

(C. Madison Brewer, Director, Office of Management Information Systems and Support, Executive Office for U.S. Attorneys, Dept. of Justice, The Implementation of PROMIS in the United States Attorneys' Offices, speech on behalf of U.S. delegation to Council of Europe Colloquy on Use of Computers in the Administration of Justice, November, 1982)

John Philip Nichols didn't howl under twelve full moons before the gambling was underway and, in the desert night, people flocked from all over to Indio Bingo and to the poker casino at the fork of Highway 10 and Highway 86.

Under a major corporation's umbrella subsidiary, later to be named Cabazon Arms, the gun runners and the money traders soon arrived, the weapon makers and the generals from Babylon, contra resuppliers, covert operatives from both the East and the West and, in what one source calls "a marriage of necessity," the dope dealers, the mobsters and the murderers.

Whatever John Philip Nichols saw in the dark cathedral of those desert nights in silence and certainty cracked and came unglued. After a number of still unsolved execution-style murders and a solicitation-for-murder charge for which he was jailed, the dark vision of John Philip Nichols eroded. Although he's been released from a short stint in prison, he's a one-eyed Jack now since only Indio Bingo gambling — managed by his sons, the Las Vegas-managed poker casino, the Indians and the most formidable creatures of the desert remain.

Several of the Cabazon Arms associates during the 1980s are coming out of the shadows to take top billing for the actual participation in the multi-million dollar laundered payment to the Iranians to delay the release of the hostages, in shutting down the dope and dirty money schemes of Nugan Hand and resurfacing its activities, in assisting Gerald Bull in the refinements and distribution of his weapon arsenal including his Super Gun and in the development of the Fuel Air Explosive technologies — thought to be responsible for the Beirut bomb which killed 241 U.S. servicemen.

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his Mercedes sedan. His partner, Michael Hand, has been missing since the investigation widened several month's after Nugan's death. Two sources in this story report knowledge of Michael Hand's whereabouts.

The drug trafficking, the contract murders, the spies and the investment frauds revealed in the Nugan Hand inquiries bear sinister, mirror-like qualities to the gang on that isolated desert reservation in Southern California.

A little more than six months ago, on a quiet spring evening in Brussels, a guns-to-Babylon mission splintered into pieces which were later found in the UK's Teesport and in Turkey. Gerald Vincent Bull ambled down the hallway leading to his apartment when an assassin fired two 7.6 millimeter rounds at point blank range into the back of his skull. The shadowy movements of his Super Gun dream took hold and gathered momentum in the Indio desert.

Six years ago on a balmy Sunday morning in Beirut, a Lebanese boy later nicknamed "Smiling Death" raced a Mercedes truck toward a building full of sleeping U.S. soldiers. A few seconds later, 241 Americans and 56 Frenchmen were dead in what the FBI called the largest man-made non-nuclear explosion since World War II. Nicknamed "Smiling Death" because of the chilling expression that the sentry recalled on the suicide driver's face, the bomb and the driver were traced to a Lebanese Shia Muslim extremist group, the Islamic Jihad and to the most dangerous terrorist at large today, Imad Mugniyah. Mugniyah's followers had used what investigators called a "trademark" using gas to enhance a powerful explosive. Investigators determined that the device was equivalent to nine tons of dynamite, made of a sophisticated explosive enhanced by gas and only the size of an unfolded card table. Its name: The Fuel Air Explosive.

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Possession of a secret is no guarantee of its truth and while these allegations by a handful of people are indeed remarkable, they are also wrought with undocumentable details — at least thus far, and veils of deniability masking the necessary spine for a traditional journalistic effort. It is for this reason that BEHOLD, A PALE HORSE is subtitled A TRUE CRIME NARRATIVE.

The first three chapters of the manuscript should be finished within three months of an initial advance and each subsequent chapter will be delivered every month. The completed book should be ready for publication by the summer of 1991.

####

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BEHOLD, A PALE HORSE

A True Crime Narrative

by Daniel Casolaro

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Behold, a pale horse and its rider's name
was death and Hades followed him, and they
were given power over a fourth of the earth,
to kill with sword and with famine and with
pestilence and by wild beasts of the earth

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BEHOLD, A PALE HORSE

A True Crime Narrative

An international cabal whose freelance services cover parochial political intrigue, espionage, sophisticated weapon technologies that include biotoxins, drug trafficking, money laundering and murder-for-hire has emerged from an isolated desert Indian reservation just north of Mexicali.

While this cabal continues today, its origins were spawned thirty years ago in the shadow of the Cold War. In recent months, however, some of its members have emerged from the trenches like scarecrows to take gratuitous credit for their roles in delaying the release of the hostages in Iran until after the 1980 presidential election, scuttling and resettling the dope and dirty money schemes of the notorious, Australian-based Nugan Hand Bank, assisting Super Gun maker Gerald Bull who was assassinated last spring in Brussels and for the development and distribution of the Fuel Air Explosive which can pack the power of a nuclear weapon in a shoebox.

I propose a series of articles and a book, a true crime narrative, that unravels this web of thugs and thieves who roam the earth with their weapons and their murders, trading dope and dirty money for the secrets of the temple.

BEHOLD, A PALE HORSE will be a haunting odyssey that depicts a manifesto of deceit, decisions of conscience, good and evil, intrigue and betrayal.

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John Philip Nichols found his promised land just north of Mexicali on the wild grasses above the Salton Sea.

He was sixty years old then and the Cabazon Indian reservation on the edge of Sonora was an ideal place for him to nurse his secret self. This is the vast desert emptiness where the yucca reaches nearly forty feet high, where the Mormons saw it as a symbol pointing to the promised land and they called it the Joshua Tree. But the Joshua Tree is an ugly, unsymmetrical lily with burly arms crooked at the elbow and it points everywhere, not unlike John Philip Nichols, as if asking itself "what shall I do next?"

There is a point on the ridge of the Little San Bernardino mountains known as Salton View where you are more than five thousand feet above the desert and where, to the north, you can see the great escarpment of Mount San Jacinto and, to the south, the man-made Salton Sea, the orchards of the Coachella valley and, on a clear day, old Mexico.

It is always clear in Indio and with the clarity of the warbler in the cottonwood grove, John Philip Nichols knew that he could bring his box office charity and all his earthly possessions into the reservation of the Cabazon Band of Mission Indians.

With no more than two dozen Indians and nearly two thousand acres of desert solitaire, cactus and cottongrove, the Cabazon reservation was a suitable home for gambling, dope, dirty money and gun running and all the fugitive visions that line the edge of oppression.

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